REPORT ON THE REVIEW AND ANALYSIS

OF SOIL BACKFILL DENSITIES

IN RESPONSE TO

NRC CONCERN

NO. 7

FOR

LOUISIANA POWER & LIGHT COMPANY
WATERFORD STEAM ELECTRIC STATION
UNIT #3

EBASCO SERVICES INCORPORATED

AUGUST, 1984

REVIEW AND ANALYSIS OF SOIL
BACKFILL DENSITIES
NRC CONCERN NO. 7

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1. INTRODUCTION

In the NRC letter of June 13, 1984, the following Concern No. 7 was expressed relative to the Soil Backfill Densities:

ITEM NO: 7

TITLE: BACKFILL SOIL DENSITIES

NRC DESCRIPTION OF CONCERN:

The staff found that records are missing for the in-place density test of backfill in Area 5 (first 5' starting at Elevation -41.25'). These documents are important because the seismic response of the plant is a function of the soil densities.

LP&L shall (1) conduct a review of all soil packages for completeness and technical adequacy and locate all records and provide closure on technical questions, or (2) conduct a review of all soil packages for completeness and technical adequacy and where soil volume cannot be verified by records as meeting criteria, perform and document actual soil conditions by utilizing penetration tests or other methods, or (3) justify by analysis that the soil volumes with missing records, or technical problems as defined after the records review, are not critical in the structural capability of the plant under seismic loads.

In response to the above stated concern, the Ebasco Civil ESSE Department implemented a three stage program to resolve this concern. The review and evaluation of soil test records was conducted in accordance with approach (1) of the concern while the review and evaluation of inspection reports was conducted in accordance with approach (3) of the concern.

The study plan depicted in Table 1 and described herein, was implemented to determine if the deficiencies that do exist in the soil packages will critically effect the structural capacity of the plant under seismic loadings.

Stage I of the program consisted of a data acquisition effort. After the data was located and collected, the Stage II effort consisted of a review for completeness and data compilation. Finally, the Stage III activity consisted of an overall review and evaluation of the soil packages for technical adequacy and specification compliance.

The program effort was conducted under the direction of M. Temchin, the Resident Sr. Site Soils Engineer, who was present during the performance of the majority of the actual backfilling operations.

2. SUMMARY AND CONCLUSIONS

As a result of the study program described herein, it has been concluded that:

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A. Test Records

(1) The Class A Backfill soil test records are complete.

(2) Field and laboratory tests were performed in accordance with the specified frequencies. In less than 8% of the cases reviewed, the laboratory control tests were run at intervals slightly larger than the specified, one set per ten inplace density test criteria. The backfill placed during these periods was randomly located throughout the fills and the relative densities obtained during these intervals were found to be acceptable when compared to the specification requirements.

(3) Field tests were located in accordance with the specified random distribution. In less than 5% of the tests reviewed, the location coordinates of the inplace density tests were found to be in error. These tests were still a valid indicator of the relative density of the backfill at a random spot at a known elevation in a known fill area and were therefore found to be acceptable tests.

(4) Statistical studies of relative density were performed in accordance with the specification requirements.

(5) The Class A backfill soil densities are in accordance with the specification requirements and will provide the design structural capability to the plant under seismic loads.

B. Inspection Reports

(1) The distribution of the existing documentation throughout the backfill is essentially identical to the distribution of the field testing effort, thus indicating a one to one relationship between inspection and testing activities. Since the field testing activity is known to be complete, the inspection activity is also believed to be complete.

The majority of the missing inspection reports are therefore believed to be misplaced. Inspection trends based upon evaluation of inspection frequency and distribution indicate that the majority of the missing inspections were performed.

(2) 80% of the volume of the backfill has a sufficient quantity of each type of inspection report to fulfill the requirements of the specification and inspection procedures.

(3) For the remainder of the volume of the backfill which has missing inspection reports:

(a) 16.0% of the volume of the backfill has an average of 81% of the quantity of inspection reports required with at least one of each type of inspection report on each fill at each elevation in its volume.

(b) 3.8% of the volume of the backfill has a partially complete representation of inspection reports with one or more type of inspection missing on each fill at each elevation in its volume.

(c) 0.2% of the volume of the backfill has no inspection reports at the fill locations and elevations included in this volume.

The effect on each of these types of deficiencies has been evaluated and found to have no effect on the structural capability of the plant under seismic loads.

3. STAGE I - LOCATION OF EXISTING DATA

The primary emphasis of the Stage I activity was the collection of soils data which in addition to specifications and procedures, includes test records and inspection reports. To accomplish this task, a detailed review was performed of the following data locations:

- Ebasco Quality Assurance Records Vault
- Ebasco Engineering Files
- Ebasco Warehouse
- On-Site Laboratory Files (G.E.O.)
- Contractor Quality Assurance Records Vault (J. A. Jones)

As a result of this effort, several key document packages were located and are attached to this report for permanent storage. A brief description of each of these document packages is presented below. The hierachy of the documents is depicted in the Study Plan Flow Chart, Table No.1 attached.

DOCUMENT 1 - Ebasco Specification LOU-1564.482, R7 Filter and Backfill.

This is the latest revision of the specification under which all soil backfill was selected, placed, compacted and tested. The document presents the design requirements of the backfill activity and served as the basis for the development of the two Quality Inspection Procedures summarized below.

DOCUMENT 2 - Ebasco Quality Control Inspection Procedures, QCIP-2, RH and WQC-1, RA

These are the Ebasco Quality Control Inspection Procedures under which the soil backfill material was selected, placed, compacted, tested, documented and approved.

DOCUMENT 3 - J. A. Jones Site Inspection and Test Procedure for Backfill and Compaction, W-SITP-12, R8

This is the latest revision of the Contractor's Quality Verification procedure under which all soil backfill material was selected, placed, compacted, tested and documented.

Each of these documents required the performance of routine field and laboratory testing of the backfill material. The actual soil testing was performed by an onsite laboratory in accordance with these requirements. The following control documents were generated by the soils laboratory in addition to the standard set of test reports.

DOCUMENT 4 - Soils Laboratory - Class A Backfill Test Index

This index was developed by the test laboratory as a working record of each Class A test performed. This hardcover, bound notebook lists the test number, location coordinate, elevation date and type of test performed. It was developed as a system of assigning numbers to and documenting the completion of all Class A tests.

DOCUMENT 5 - Soils Laboratory - Class A Backfill Field and Laboratory Test Summary

This summary was developed by the soil testing laboratory as a daily tabulation of the results of soil testing performed. Contained in this document are the lab test number, fill number, test location, field density, lab density, grain size and relative density test results for each day of work, recorded on a single page for supervisory review and study.

Utilizing these records, Ebasco performed the required periodic statistical studies of insitu relative density of the backfill as described in brief in Document 6 below.

DOCUMENT 6 - Ebasco Statistical Studies of Class A Backfill Relative Densities

This document contains all of the seven statistical studies performed on the Class A backfill relative densities which document the backfills overall acceptability. It also contains letters to the earthwork contractors regulating the percent compaction criteria based upon the results of these studies.

DOCUMENT 7 - Class A Backfill Inspection Reports

In order to review the large quantity of inspection reports which make up the soil packages in the files, nine basic types of forms were identified. Document 7 contains samples of the typical forms found in each of the soil packages in the vault. These forms are discussed in detail in Stage II of the report.

After locating and collecting the data, Stage II activities concentrated on a review of the documents for completeness and on compiling the data into a format compatible for review of NRC Concerns.

In order to perform this task, the 17,000 existing soil documents were divided into the following two types:

(1) Soil Inspection Reports (Forms 1-5)
(2) Soil Test Records (Forms 6-9)

Since the test records provide a direct measure of the capability of the backfill to provide the required structural support to the plant island under seismic loadings, they were the first records to be reviewed. The remaining inspection reports were reviewed after the completion of the test record study. The details of these activities are presented below.

4. STAGE II - REVIEW OF SOIL PACKAGES FOR COMPLETENESS

A. Test Records

The first step in the review of the documentation was a detailed review of all soils laboratory documentation on site for completeness. Included in the review were:

° In-Place Density Tests - ASTM D 2167	Form 6
° Proctor Tests - ASTM 1557	Form 7
° Moisture Content Tests - ASTM D2216	Form 8
° Sieve Tests - ASTM D422	Form 9
° Relative Density Tests - ASTM D2049 (Off Site Lab)	

By comparing the Class A Backfill Test Index (Document 4) and the Field and Laboratory Soil Test Summary (Document 5) to the actual files of soil test data at the onsite laboratory, a complete set of field and laboratory test records was found to exist.

In direct response to the first paragraph of the NRC Concern No. 7, attached in Appendix "A" are copies of the 34 in-place density tests performed in the first 5.5' of fill placed in Fill Area #5 from Elevation -41.75 to EL -36.25. In addition to the density tests records, Table A-1 summarizes the elevation of the test, the test coordinate, the test number, the date the test was performed and, documents the number of the reference proctor and grain size lab tests used to determine specification compliance. Each test location and relative density are plotted on the corresponding overlay plots in Document 9 of this report.

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Utilizing the complete set of backfill density test records and the Class A Backfill Field and Laboratory Test Summary (Document No. 5), and keeping in mind the goals of completeness and technical adequacy, two new documents were developed for subsequent evaluation. A brief description of each of these documents and methodology used to prepare the documents is presented below.

DOCUMENT 8 - Class A Backfill Test Index by Fill Number in Ascending Elevation

This document is a complete listing of all Class A density tests categorized by fill area in order of ascending elevation. It lists for each fill area, the field density test location number and date of performance in order of ascending elevation.

This tabulation served as the basis for the preparation of the overlays of relative density by elevation, Document 9 discussed below.

DOCUMENT 9 - Class A Backfill Relative Density Overlay Plots By Elevation

In order to evaluate the frequency and distribution of field test and relative density, the following procedure was used to construct the overlay plots:

(1) All Class A density tests were regrouped by fill number in order of ascending elevation (Document No. 8).

(2) A key plan drawing of the plant island excavation was constructed containing the soil backfill grid system. One original sheet was used for each one foot interval of backfill. Relative density overlay plots were then constructed from EL -44 to Elevation +20 to encompass all Class A backfill density tests.

(3) Using Document 8, each density test was plotted on the form using the test coordinates and elevation. A different symbol was used for each respective fill number. The test number was recorded adjacent to each data plot. It should be noted that the boundaries of each fill area are not represented. This is because the boundaries were somewhat arbitrary and changed in exact location at different elevations in the fill. In addition, backfill activities typically involved areas smaller than the numbered fill area, and in some cases, was carried across fill boundaries.

(4) The test number was then recorded in the test schedule on the side of the overlay along with the relative density value for each test found from the Class A backfill Test Summary (Document 5).

(5) For Class A backfill placed above Elevation +13 (See Statistical Study No. 7, Document 6), the percent compaction value for each field test was found in the Class A Backfill Field and Laboratory Test Summary (Document 5) and recorded in the test schedule with as asterisk.

(6) Once the data was plotted and tabulated, the theoretical surface boundaries of the backfill were approximated utilizing the fill boundaries and the Nuclear Plant Island exterior walls. The surface area of the backfill at each elevation was then calculated with a planimeter and recorded on the overlay.

(7) In cases where the actual distribution of the plotted density tests indicated backfill placement outside of the theoretical boundaries, the fill boundary was extended to include that material.

(8) By dividing the surface area by 20,000 ft^2, the minimum number of density tests required by the Specification LOU-1564.482 was calculated and recorded on the overlay.

(9) Finally, the actual number of density tests performed at each elevation was recorded, completing the overlay.

The completed overlay plots are a graphical presentation of the density test frequency and distribution, and most importantly, they tabulate and display the final insitu relative densities and/or percent compaction of the backfill.

These plots were utilized in the review and evaluation of Test Records for technical adequacy and specification compliance in the Stage III-A of the Study Program.

B. Inspection Reports

In the review and evaluation of the completeness of the inspection documentation, the following factors were considered:

- The requirements of the Quality Control Inspection Procedure in force at the time the work was done. Three different Ebasco procedures and one Contractor procedure existed during the eight years of placement. Each procedure was revised numerous times. Therefore, different inspection report forms were in use at different times during backfilling operations.

- The location and elevation of the fill. Some forms were used to document inspections of activities which were not common to all fill placements. Therefore all forms were not required in all packages.

- The frequency of inspection. Some backfilling activities required 100% Ebasco inspection and others not. Since the work was done by a contractor that had an acceptable quality assurance program, Ebasco inspection was designated as "once per day, by Checklist, when work is in progress." (QCIP-2, Section 8.4.2 - Document 2).

(2) Completeness and Distribution of Inspections

During the Stage II review activity, the total file of inspection reports for Class A backfill was inventoried and combined into compatible soil packages as exemplified in Document 7. Included in the inventory were approximately 12,000 inspection reports ranging from EL -44 to EL +20 throughout all seven fill areas. The reports were grouped and compiled by fill location, elevation and placement date for each of the five types of inspection forms summarized above. The resulting inventory of inspection reports is presented in Table No. 2 and discussed below.

The evaluation of these inspection reports was further divided into two phases; the evaluation of the inspection reports to determine their overall completeness and the evaluation of the frequency and distribution of inspection reports to determine their content. The following discussions summarize the results of these evaluations:

a. Completeness of Inspections

In the evaluation of the completeness of the inspection documentation, it must be noted that the exact numbers of inspection documentation required by the governing procedures cannot be reconstructed. Certain of the five types of inspections were required on a daily basis (100% coverage - Forms 1, 2 & 4) while others were required on a partial coverage basis (Form 3 & 5). For this reason several comparitive analyses were performed to evaluate relative completeness of the documentation.

When evaluating the total number of forms existing for each type of inspection (Table 2), it is found that Forms 2 and 4, which are representative of the required 100% inspection, number an average of 2900 each, and that Forms 3 and 5, which are representative of a partial inspection, number as average of 2000 each inspections. The Form 1 inspection (J. A. Jones Daily Inspection Report) which was performed at a 100% coverage and thus should have resulted in approximately 2900 forms, appears to be incomplete. It must be noted, however, that the Form 1 daily inspections by J. A. Jones and the Form 4, Daily Inspections by Ebasco, were duplicate inspections of the same placement and compaction activities. Since the missing Form 1 data is found on the duplicate Form 4 Inspection Reports, which appear to be complete, the missing Form 1 Reports constitute no loss of quality documentation and have no further significance to the inspection report evaluation unless the corresponding Form 4 is missing. Thus the existing inspection documentation would indicate that 100% inspection coverage consists of 2900 inspections.

In order to evaluate the validity of this number, consideration was given to the complete set of field density test records presented in Table No. 5 (which will be discussed in more detail in the evaluation discussions of density testing). This table indicates that 3076 Class A density tests were performed when

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(1) Description of Inspection Forms

Considering these variations in procedures, fill locations and inspection frequencies, the following basic inspection report forms were found to exist, samples of which are found in Document 7:

- Form #1 - J. A. Jones Daily Backfill Inspection Reports
  W-SITP-12 (R1-R8)

  These forms summarized the overall acceptability of the daily backfill operation including material acceptability, excavation, backfill placement and compaction, and field testing. They were completed by the contractor on a daily basis for each backfill area of major earthwork.

- Form #2 - Ebasco Borrow Material Inspection Reports
  QCIP-2-1/WQC-1-9

  These forms summarized the acceptability of the borrow material used for Class A backfill including the material source, moisture content and gradation check test results. This inspection was performed by Ebasco daily.

- Form #3 - Ebasco Excavation and Stripping Inspection Reports
  QCIP-2-2/WQC-1-17

  These forms summarized the acceptability of the activities performed in preparing the fill area for the new backfill placement. Included on this form are drainage conditions, stripping, excavation, cleanup and moisture and density testing of exposed materials. The form was primarily utilized for excavation stripping and grubbing when the Class A backfill abutted and joined the natural clay slopes (below EL -5). Above this elevation, the use of this form was up to the discretion of the Ebasco Inspector.

- Form #4 - Ebasco Daily Backfill Inspection Reports
  QCIP-2-3/WQC-18

  These forms summarized the acceptability of the daily backfill operation emphasizing the backfill placement, compaction and field testing. It is very similar to the Form #1 completed daily by the J. A. Jones, quality verification inspection force and was utilized daily by Ebasco for all major Class A backfills.

- Form #5 - Ebasco Backfill Acceptance Report
  QCIP-2-4

  This form summarized the findings of the Ebasco inspection report forms #2, 3 & 4 and the soil laboratory test results resulting in the overall acceptance of a particular fill. The form was discontinued in revision H of QCIP-2 (12/6/77).

only 858 tests were required based upon the one test per 20,000 ft^2 specified frequency. Thus approximately three times as many tests were performed as the fill surface area would require. Since the specification also requires one test for each area less than 20,000 ft^2 placed in any one day, the existence of so many extra tests would indicate that the large majority of fills placed were less than 20,000 ft^2 and that the testing frequency was governed by the less than 20,000 ft^2 placed in any one day criterion. This is further substantiated by a review of the density overlay plots (Document 9) which clearly indicate small fill placements at the upper elevations and around specific construction items. This being the case, since each small fill area of less than 20,000 ft^2 worked required a test, it would also require a set of inspections for the same fill area. Noting that the 3076 field density tests constitute a complete set of test records and considering the correlation developed above it is reasonable to conclude that the total number of inspection report packages for 100% coverage should also number around 3076. Taking into account that a small percentage of fills had more than one density test per fill, because their surface areas exceeded 20,000 ft^2, the number of required inspection packages should be slightly less. By comparing the 2900 existing inspections that represent the 100% inspection frequency to the 3076(-) packages which should have existed. It is concluded that based on this comparison, the inspection documentation files are substantially complete.

To further evaluate and better define the completeness of the inspection reports, a comparative analysis was performed of the surface area indicated on the Inspection Reports to the total surface area of the fill areas.

In this analysis, the surface area recorded in each of the daily inspection report packages (Form 1 or 4) was totalled and compared to the total surface area of the backfill at each elevation as calculated on the overlay plots (Document 9). By comparing the actual surface area of backfill inspected to the total surface area of backfill placed, the percentage of inspection coverage was calculated. The results of this analysis are summarized in Table No. 3 and discussed below:

(1) The actual inspected surface area in some cases was larger than the theoretical surface area (overlay plots). This is because many fill areas were constructed on more than one day, thus generating two reports for the same area.

(2) Evaluation of the percent of inspection coverage column of Table 3 indicates that for 80% of the volume of the backfill, there exists a sufficient quantity of each type of inspection to document the acceptability of the backfill represented by the inspected surface area.

(3) For the remaining 20% of the volume of the backfill which was found to have missing inspection reports, the average percent of inspection coverage was found to be 81%.

As a result of these analyses of the completeness of the inspection documentation, it is concluded that the documentation is basically complete with 80% of the volume of the backfill documented with complete soil packages and the remaining 20% of the backfill containing partial deficiencies in the inspection reports.

b. Distribution of Inspections

As part of the evaluation of the significance of the missing inspection reports, the distribution of the existing inspection documentation was evaluated.

To consider the distribution of the existing inspection reports throughout the fill area, Table No. 4 was developed. It compares the distribution of the inspection effort to the distribution of the field testing effort which is known to be complete. By comparing the percent of inspections on each fill area to the percent of field density testing on each fill area, it is found that both the inspection and testing activities have essentially identical distributions of effort. This observation further supports the correlation that approximately one inspection report should exist for each density test and strengthens the conclusions that the inspection report documentation is basically complete.

In the further evaluation and definition of the distribution of the types of inspection reports shown in Table No. 2, two distinct trends are immediately apparent, with the division in trend at elevation -25.00.

(a) Between elevation -25 and the bottom of the excavation, there exist 53 fills with partial distribution of inspection report documentation, or none at all. Of these 53 fills:

- 25 fill areas have some types of inspections by both the Contractor and Ebasco. These fills constitute 6.3% of the total number of fills constructed and account for 1.8% of the total volume of Class A backfill constructed.

- 21 fill areas have inspection documentation by both the Contractor and Ebasco. These fills constitute 5.3% of the total number of fills constructed and account for 2.0% of the total volume of Class A backfill constructed.

- 6 fill areas have no inspection documentation. These fills constitute 1.5% of the total number of fills constructed and account for only 0.2% of the total volume of backfill constructed.

(b) For the remainder of the fill placements between elevation -25 and plant grade with minor exception, the data in Table 2 indicates that each type of inspection was performed at least once on each fill area at each elevation. In some cases, as many as 60 inspections of a particular type were performed on one fill at one elevation (Fill #6, EL 13.00 - 13.99).

Thus, a review of the distribution of the types of inspection reports that are missing indicates that the 52 fill areas with an incomplete distribution of inspection documentation are concentrated in 13.1% of the total number of fill areas constructed and account for only 4% of the total volume of backfill placed.

The impact of these findings on the evaluation of the technical adequacy of the inspection reports is discussed in Stage III-B of this report.

4. STAGE III - REVIEW AND EVALUATION OF SOIL PACKAGES FOR TECHNICAL ADEQUACY AND SPECIFICATION COMPLIANCE

A. Test Records

The review and evaluation of the technical adequacy of the Class A backfill to provide structural capability of the plant under seismic loadings was based upon the design requirements as stated in the Ebasco Specification LOU-1564.482. Those sections pertinent to the Class A backfill soil density are as follows:

" In-Place Density and Testing

Sand materials and clam shell to be used as Class A backfill shall have an in-place relative density of 75 percent. The variation for Class A fill from the above specified degrees of compaction shall be a maximum of one standard deviation less than the specified relative density. The numerical value of the standard deviation from Class A fill will be established by a series of field tests to be conducted during the initial compaction operations and will be reported in terms of minimum allowable density required.

The minimum allowable density for the basis of field control at the start of work and until establishment of the standard deviation for Class A fill shall be 95 percent of Modified Proctor. The required percent compaction will be adjusted either up or down, depending upon the results of statistical studies which will be made during the backfilling operations in order to maintain the 75 percent relative density requirement.

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"Clay materials to be used for Class A backfill shall have in-place density of 90 percent of the maximum density obtained in the Modified Proctor Compaction Test. All materials to be used for Class B backfill shall have an in-place density of 90 percent of the maximum density obtained in the Modified Proctor Compaction Test. The variation from the above specified degrees of compaction shall be a maximum of 10 percent of the density test results falling a maximum of 5 percent less than the specified density in a random distribution as determined by the Engineer.

.1 Control tests of densities and moisture contents shall be made by the Engineer as the work progresses, to assure that required densities and moisture contents are being achieved.

.2 The in-place density shall be tested in accordance with ASTM-D1556, ASTM-D2167, ASTM-D2922 and any other method suitable in the judgment of the Engineer to insure that the backfill has been properly compacted. One test shall be made in each layer for every 20,000 sq.ft. of compacted Class A fill area and one test for every area of less than 20,000 sq. ft. placed in one day.

.3 The optimum conditions for both moisture and density will be determined by the Engineer for the fill materials. One laboratory density test (ASTM-D1557) and one mechanical gradation test (ASTM-D422) shall be performed on samples taken from in-place density test holes for each ten in-place density tests performed. The results of these tests made during the backfilling operation shall be made available to the Contractor."

In summary, the basic criterion of the specification were to:

- Obtain 75% relative density in the Class A fill.
- To check the compaction of the fill with field in-place density and moisture tests and laboratory density and gradation tests at specified frequencies.
- To perform periodic statistical studies of the Class A backfill relative density in order to evaluate the results.

Compliance with these requirements is discussed in the following sections.

(1) Test Frequency and Distribution of In-Place Densities

By using the completed density overlay plots (Document 9), the frequency of Class A in-place density tests (ASTM D-2167) performed for each one foot elevation of backfill was compared to the backfill specification criteria stated above. Since each in-place density test includes a moisture test, verification of moisture tests was simultaneously developed with the density review.

In addition to this criteria, inherent in the requirement for the performance of statistical studies is the need to demonstrate a random distribution of test data. By studying the location of tests on each fill, an evaluation of the random distribution of the test pattern was also performed.

Table No. 5 and Document 9, the overlay plots present a summary of the results of these reviews. The minimum number of field density tests required for each fill was tabulated along with the actual number of tests performed and the distribution of those tests by fill number.

Since the relative density overlay plots were constructed at even one foot intervals and the backfill was placed in 15" lifts, density tests at an elevation one foot above and below each plot were reviewed to determine specification compliance. In addition, backfill placed in adjacent fills was also evaluated since each test represents 20,000 ft^2 of backfill. Thus, by superimposing three overlay sheets (36" of compacted fill), a three dimension test distribution was reviewed for each lift of backfill.

The results of a simultaneous review of Table No. 5 and the overlay plots indicates the following:

(a) A comparison of the total volume of the Class A backfill shown on the overlays to the neatline quantity shown on the design drawing (LOU-1564-G-497S01, R6) indicates that the overlay Class A soil volume is 33% larger than the design quantity. This is due to the actual expansion of the Class A fill boundaries into Class B fill areas at the higher elevations during construction (as shown on the overlays as indicated by actual test locations). Taking the expanded backfill boundaries into account, the following evaluations were made:

(b) Based on the testing frequency of one field density test per 20,000 ft^2 of fill, 2794 in-place density tests were performed in fill areas requiring 858 tests. Thus, approximately three times as many density tests were run as the surface area of the fills required. This was due to the placement of numerous smaller fills each day at the higher elevations.

(c) On only one fill of the 385 fills studied, was there an inadequate number of density tests performed in the 3 foot wedge of backfill reviewed (Fill #2, EL -19). In this case, the size of the fill was small and the relative densities of the fills on both sides and above and below this fill all met the specification requirements. Therefore, it is concluded that this deficiency will have no significance on the stability of the Plant Island under the event of seismic loadings.

(d) Visual analysis of the location of the density tests shows them to be completely random and distributed without pattern throughout the backfill. It should be noted that some test locations on the lab forms were found to be in error (approximately 5%) when plotted on the overlays. This is certainly due to the inaccuracies of visually locating ones position in the field off of sign posts hundreds of feet away and tens of feet above the actual test elevation. Since these test locations were still indicative of the relative density at a random spot on the fill, the density values were accepted as valid and included in the density analyses.

Taking these factors into consideration, it has been determined that the specification requirements for in-place test frequency and distribution have been complied with.

(2) Frequency of Laboratory Control Tests

By using the Class A Backfill Test Index (Document 4) and the Field and Laboratory Soil Test Summary (Document 5), the frequency of the laboratory density control tests performed (ASTM D1557) and the mechanical gradation control tests performed (ASTM D-422) was compared to the specification requirements.

Table No. 6 presents the results of a detailed review of the laboratory testing frequency compared to the number of in-place density tests performed between laboratory check tests. Using the specification requirement of one set of control tests per ten in-place density tests, all nonconforming test intervals were tabulated in Table No. 7.

An evaluation of the data presented in these tables indicates the following:

(a) From the start of Class A backfilling operation in January, 1976 to the present date, a total of 3137 Class A in-place density tests have been performed. Of these 2794 tests are in backfill subject to potential liquefaction while the remaining 282 test are above this zone. During the same period of time, 361 sets of control tests (Proctor, Sieve and Moisture Tests) have been performed, thus averaging one set of tests per 8.6 in-place density tests compared to one set per 10 in-place density tests as required in the specification.

(b) During the performance of the 361 sets of control tests, in only 27 instances were the tests performed at intervals larger than the specification requirements. Thus, the control test frequency was adhered to 92.5% of the time in the last eight and one half years of backfilling activity.

(c) Analysis of the nonconforming intervals indicates that in 20 of the 27 cases, the test interval was extended from 10 to a maximum of 13 field tests per set of control tests. Since in each of these cases, the extra in-place density tests included in the extended interval were in material on the same fills, already tested in the allowable 10 density tests, the intent of the specification was complied with in these cases. By accepting these intervals, the intent of the specification requirement on control test frequency was adhered to 99.8% of the time.

(d) In the remaining seven cases, where the control test interval was extended from 15 to a maximum of 29, a review of the test locations and relative density test results presented in Table No. 8 indicates that the test intervals are completely random through the fill as a whole and that the relative densities obtained during these intervals are all acceptable within the statistical tolerance of the specification.

Taking these factors into consideration, it has been determined that the specification requirements for the performance of laboratory control tests relative to Class A backfill in-place density testing, has been complied with.

(3) Performance of Statistical Studies

Document 6 presents copies of all seven statistical studies performed during the actual backfilling operation, in addition to letters to the backfilling contractors informing them of the results. In addition, Table No. 9 presents the schedule of relative density correlation testing showing the periodic updating of these correlation curves during the major period of backfilling operations.

From these documents it has been concluded that:

(a) The specification requirements for the periodic performance of statistical studies during the backfilling operations has been complied with and that;

(b) The value of the field control (percent compaction) was adjusted either up or down, depending on the results of the statistical studies.

Taking these factors into consideration, it has been concluded that the statistical review of the relative densities of the Class A backfill was performed during the backfilling operations in accordance with the specification requirements.

(4) Class A Backfill Relative Density

In analyzing the relative density of the compacted Class A backfill as a whole, the following statistical approach was adopted to comply with the specification requirements.

The specification required the in-place compacted Class A backfill to have a relative density of 75 percent. The allowable variation for the Class A fill less than the specified density was a maximum of one standard deviation. The numerical value of the standard deviation for this material was periodically established by conducting a series of studies on field tests and was reported in terms of minimum allowable proctor density required to yield the required relative density.

During the performance of these statistical studies, the field densities were converted to relative densities by the use of the correlation curves. The correlation curves were constructed using cumulative test data from random samples taken from the fill. The following procedure was used to develop these curves.

For each family of materials:

(a) A representative 300 lb. sample was obtained from the fill for every 200 to 250 in-place density tests performed.

(b) A 100 lb sample was sent to the field lab and a 200 lb sample was sent to the home office lab (Peabody Testing) for parallel testing to determine a modified proctor compaction curve and percent finer than a #200 sieve.

(c) The parallel results were compared. The Proctor densities were found to agree within ±2 pcf and the percents finer than the #200 sieve within ±3 percent. Therefore, the home office lab proceeded to perform maximum (γmax) and minimum (γmin) density determinations on the material.

(d) The following equation was used to plot the correlation curves.

$$\text{Dry Density} = \frac{(\gamma_{max.}) \times (\gamma_{min})}{\gamma_{max.} - Dr\,(\gamma_{max.} - \gamma_{min})}.$$

Where:

Dry Density = field dry density

Dr = relative density

γmax, γmin. = measured in the home lab for this material type.

Each curve was established by assuming various D_r values and calculating Dry Densities.

Cumulative Statistical Study No. 6 (Document No. 6) was performed in August of 1978, and represented all Class A backfill placed to that date. Statistical Study No. 7 was performed in July, 1984 and includes the remainder of Class A tests in the backfill subject to potential liquefaction. For both studies, correlation curves of field density to proctor density were developed for three family of materials. The results of these studies are summarized as follows:

Study No. 6

Based upon the standard properties of the normal bell curve, the cumulative Study No. 6 was performed on 2499 Class A backfill tests. The density values of the original failing Class A density tests (that were retested) were not included in this study since those tests did not represent the final density of the backfill which formed the seismic support of the Plant Island.

The study determined that the standard deviation for all Class A backfill was 12.4%. The specification tolerances were then defined by this standard deviation (in a three standard deviation universe) as:

(a) 13% of the Class A backfill tests could have relative densities ranging from 62.6% to 75.0% and

(b) 3% of the Class A backfill tests could have relative densities ranging from 50.2% to 62.6%.

Using these definitions, cumulative Study No. 6 concluded that the Class A backfill was constructed in accordance with the 75% relative density requirement. In addition, those tests which fell below 75%, were found to be within the specification tolerances when compared to an allowable tolerances of 16%. Therefore, the backfill was found to be in compliance with the specification requirements.

Study No. 7

Study No. 7 consisted of 251 in-place density tests taken in backfill placed since August 1978 up to elevation +13.00 (the upper boundary above which liquefaction will not occur, see Study No. 7, Document 6). The results of this study indicate a mean relative density of 91.7% with a standard deviation of 18.6%.

The mean relative density is well above the specification requirements and is somewhat higher than the mean relative density from study No. 6 (83.8%). The standard deviation for the current work is larger than for previous studies. This is certainly not surprising considering the large variation in compaction techniques utilized to construct backfill in the six years of operations included in this study.

The actual number (12.4%) and values of in-place density tests in Study No. 7 which fell below the minimum density of 75% was found to be within the 16% allowable tolerance.

In summary, the backfill included in Study No. 7 was found to be in conformance with the specification requirements. Taking this into account and considering that:

(1) All the backfilled placed prior to this study also was in compliance with the specification requirements; and

(2) Study No. 7 completes the series of studies on backfill subject to potential liquefaction;

it is concluded that all backfill was placed in compliance with the specification requirements and that the final insitu soil densities will provide the required design structural capacity to the plant under seismic loadings.

B. Inspection Reports

The results of the Stage II evaluations on completeness and distribution of the existing inspection documentation, determined the following:

(1) Completeness of Inspections

Although no exact method exists for determining the quantity of inspections that were required during the backfill operations, two comparative analyses were performed to evaluate the relative completeness of the inspection documentation. These analyses concluded that the existing documentation is basically complete and that 80% of the volume of the backfill is documented with complete inspection packages while the remaining 20% of the backfill has some deficiency in the inspection packages.

(2) Distribution of Inspections

The distribution of the existing inspection documentation throughout the backfill is essentially identical to the distribution of the field testing effort by fill location, thus confirming a one to one relationship between inspection and testing activities.

For the 20% of the inspection packages found to be incomplete, three distinct types of discrepancies were found to exist. The following discussions and conclusions are presented relative to the effect of these discrepancies on the technical adequacy of the inspections.

(a) 16.0% of the volume of the backfill has an average of 82% of the quantity of inspection reports required with at least one of each type of inspection report on each fill at each elevation in this volume.

For example, although there are 28 existing Form 2 Inspection Reports, in the vault for Fill No. 3 at elevation +12 (Table No. 3), 6 Form 2 inspection reports are believed to be missing. In all these cases however, the 81% of existing documentation of each type of inspection clearly establishes that the Quality Control and Quality Verification processes were implemented during the construction process. In addition, the backfill relative density study documents that the required density tests were performed and resulting relative density for the fills included in this 16% volume were found to be within specification requirements. Thus the existing inspection reports coupled with the satisfactory density records indicate that this deficiency will have no significance on the stability of the Plant Island under seismic loadings.

(b) 3.8% of the volume of the backfill has a partially complete representation of inspection reports with one or more type of inspection missing on each fill at each elevation in this volume. Included in this volume of backfill are:

- 25 fills which have inspection records from both the Contractor and Ebasco. Although some of the five required inspection reports are missing, there exists a sufficient quantity of data on the existing reports to determine that the Quality Control and Quality Verification processes were implemented during the construction of each of these fill areas. In addition, the design specified relative densities were achieved within the specified tolerances (Section IIIA) for all the fills affected. Therefore, it has been concluded that this deficiency, which effects 1.8% of the backfill, will have no significance on the stability of the Plant Island under the event of seismic loading.

- Also, included in these fill areas are 21 fills which have documentation of inspections by either Ebasco or the Contractor. Since Ebasco did a 100% duplicate inspection of the contractors inspection, the fact that contractor inspection reports are missing does not

necessarily lead to a loss in the documentation of quality. As stated before, the existing inspections on these fills clearly establish that the quality control process was implemented during the construction process. In addition, it should be noted that in accordance with the Quality Control procedures (Document 2 & 3), the in-place density tests performed on each of these fills were ordered by and directed by the Ebasco Q.C. Inspector. He witnessed and evaluated each field test for specification compliance while the test was being performed in the field. If the percent compaction was not in compliance with the specified minimum, the Ebasco QC Inspector directed the Contractor's QC Inspector to implement rework (recompaction). The rework was witnessed by the Ebasco Inspector and at its completion, retests were taken at his direction. Thus, the existing inspection documentation, coupled with the complete file of test records for each fill involved (indicating acceptable relative density and quality control involvement) indicate that this deficiency, which effects 2.0% of the backfill, will have no significance on the stability of the Plant Island under the event of seismic loadings.

(c) 0.2% of the volume of the backfill has no inspection reports at the fill locations and elevations included in this volume.

For these 6 fill areas, there was no inspection documentation found onsite. The material in these fills is found to be concentrated below elevation -37 in small drainage ditches and trenches which have very little volume or in fills. As stated above, the complete record of density testing testifies to the total involvement of the quality control inspectors and to the achievement of the relative density. The fact that the majority of the missing reports are clustered together in groups on three fills indicates a high probability of lost folders of soil packages. Thus, even if the records are lost, the acceptability of the relative density, the indication of Q.C. involvement, and the fact that the affected fills account for for only 0.2% of the backfill placed provides sufficient evidence to conclude that this deficiency will have no significance on the stability of the Plant Island under the event of seismic loadings.

Considering the discussions above, it has been concluded that the deficiencies found to exist in the inspection documentation are of minor significance and will have no effect on the structural capability of the plant under seismic loads.

TABLES

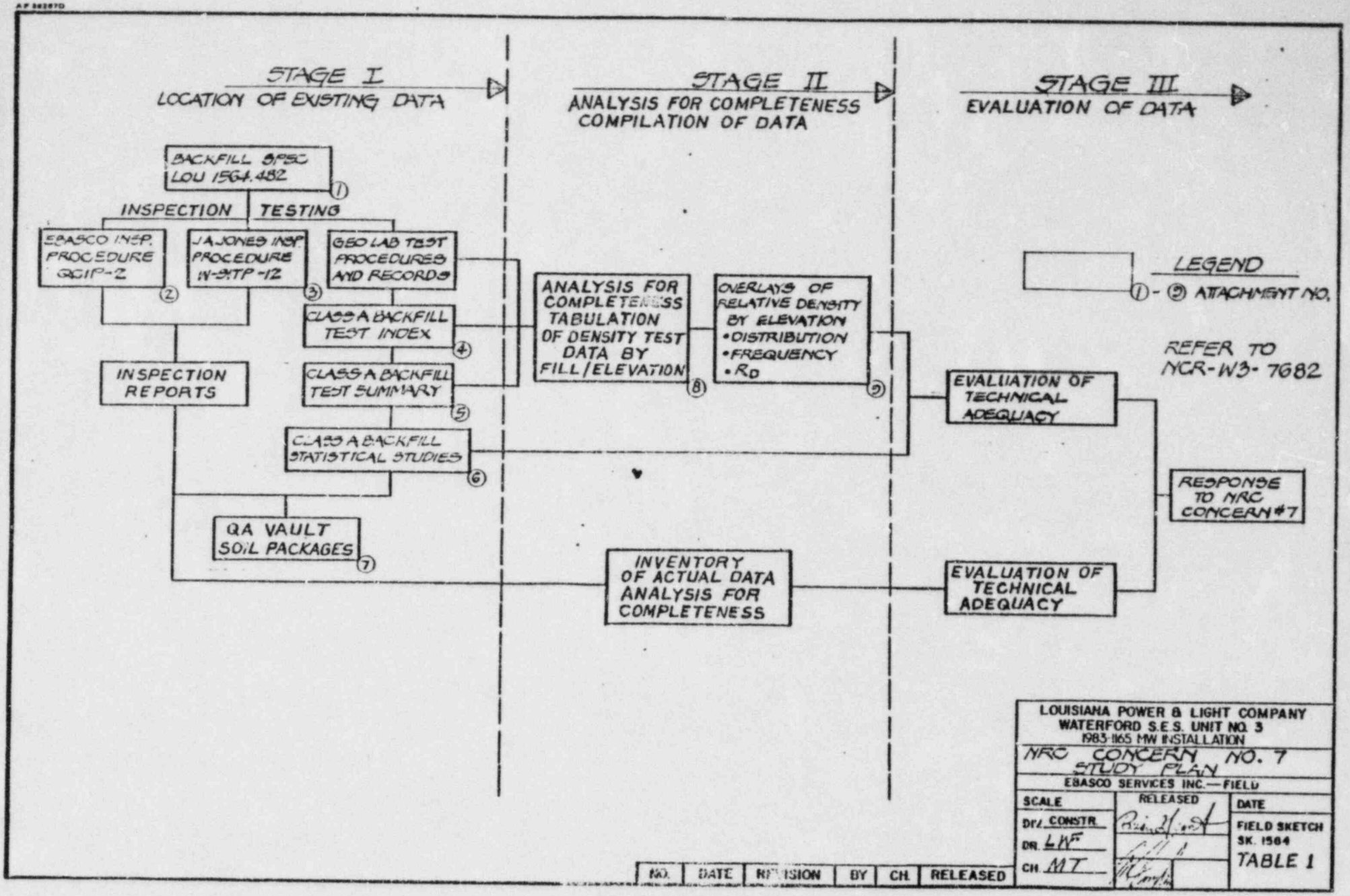
STAGE I
LOCATION OF EXISTING DATA
STAGE II
ANALYSIS FOR COMPLETENESS
COMPILATION OF DATA
STAGE III
EVALUATION OF DATA
BACKFILL BFSC
LOU 1564.482
1
INSPECTION
TESTING
EBASCO INSP. PROCEDURE QCIP-2
2
J A JONES INSP. PROCEDURE W-3TP-12
3
GEO LAB TEST PROCEDURES AND RECORDS
CLASS A BACKFILL TEST INDEX
4
INSPECTION REPORTS
CLASS A BACKFILL TEST SUMMARY
5
CLASS A BACKFILL STATISTICAL STUDIES
6
QA VAULT SOIL PACKAGES
7
ANALYSIS FOR COMPLETENESS TABULATION OF DENSITY TEST DATA BY FILL/ELEVATION
8
OVERLAYS OF RELATIVE DENSITY BY ELEVATION
• DISTRIBUTION
• FREQUENCY
• RD
9
INVENTORY OF ACTUAL DATA ANALYSIS FOR COMPLETENESS
EVALUATION OF TECHNICAL ADEQUACY
EVALUATION OF TECHNICAL ADEQUACY
RESPONSE TO NRC CONCERN #7
LEGEND
① - ⑨ ATTACHMENT NO.
REFER TO NCR-W3-7682
NO. DATE REVISION BY CH RELEASED
LOUISIANA POWER & LIGHT COMPANY
WATERFORD S.E.S. UNIT NO. 3
1983-1165 MW INSTALLATION
NRC CONCERN NO. 7
STUDY PLAN
EBASCO SERVICES INC.—FIELD
SCALE
DR. CONSTR
DR. LWF
CH. MT
RELEASED
DATE
FIELD SKETCH
SK. 1564
TABLE 1

TABLE NO. 2

NRC CONCERN NO. 7

ANALYSIS OF SOIL INSPECTION REPORTS

ELEVATION	FILL 1 FORM NO 1 2 3 4 5	FILL 2 FORM NO 1 2 3 4 5	FILL 3 FORM NO 1 2 3 4 5	FILL 4 FORM NO 1 2 3 4 5	FILL 5 FORM NO 1 2 3 4 5	FILL 6 FORM NO 1 2 3 4 5	FILL 7 FORM NO 1 2 3 4 5	TOTALS FORM NO 1 2 3 4 5	COMMENTS
-44.00 - -43.01	* * *	* * *	* * *	* * *	* * *	1	* * *	1 0 0 0 0	* NOT REQUIRED
-43.00 - -42.01	* * *	* * *	* * *	* * *	* * *	5 6 6 4 8	1	6 6 6 4 8	
-42.00 - -41.01	* * *	* * *	2 1 1 1 1	* * *	* * *	10 10 10 4 16	1	12 11 12 4 17	
-41.00 - -40.01	* * *	* * *	1 1	4 2 2 4	* * *	9 7 6 5 5	1	15 9 8 10 5	
-40.00 - -39.01	1 1	* *	2 1 2 2 1	1 1		17 10 11 11 14	1	21 12 14 16 16	
-39.00 - -38.01	5 1 1 3 2		3 1 2 3 1	4 3 3 4 3		11 9 7 9 8	2 1 2	25 14 14 21 14	
-38.00 - -37.01	3 3 2		6 5 6 6 5	2 2 2 4 2	2 2 2 2 1	10 5 7 7 6	22 22	50 14 17 44 16	
-37.00 - -36.01	3 2 2 2 3	1 1 1 1 1	7 5 7 6 6	6 3 3 4 3	6 4 5 5 6	18 13 10 16 14	3 1 1 2 1	44 27 28 36 34	
-36.00 - -35.01	2 2 2 2 2	1	9 9 11 10 10	2 1	4 2 2 4 1	9 5 5 6 5	3 1 2	30 18 21 26 18	
-35.00 - -34.01	1	2 1 1 1 1	3 4 5 4 4	1 1 2 1 1	1 1 1 1 1	5 6 12 7 8	4 3 1	18 13 25 15 15	
-34.00 - -33.01	1	2 1 1 1 1	4 2 4 2 2	1 1 1 1	2 2 2 2 3	2 4 4 4 4	4 1 4 1 1	16 11 15 11 12	
-33.00 - -32.01	1 1 1 1 1	1 1 1 1 1	4 3 5 3 2	1 1	1 2	3 4 5 4 4	3 1 4 1 1	14 10 16 10 12	
-32.00 - -31.01	1 2 2 1 3	2	4 4 4 4 3	1 1	1 1	2 2 2 2 2	4 3	15 8 13 7 10	
-31.00 - -30.01	1 1 1 2	2	4 5 8 5 4	1 1	1	4 5 5 5 5	3 3	15 11 17 10 7	
-30.00 - -29.01	1	2 1 1 1 1	8 9 9 9 10	1	1 1	1 4 4 2 5	3 3 2	16 14 17 13 17	
-29.00 - -28.01	1 1 1 2	2 1 1 1 1	4 4 6 4 4	1	1	1 4 4 4 4	5 1 4 2 1	15 11 16 11 12	
-28.00 - -27.01	1 1 1 1 1	1 1	5 4 9 4 4	1	1	4 4 4 4 4	3 3	16 2 17 10 9	
-27.00 - -26.01	1 1 1 1 1	1 1	2 2 5 2 2	1	1	3 4 4 3 4	4 1 4 2 1	13 8 14 9 8	
-26.00 - -25.01	1 1 1 1 1	2 2 2 2 2	3 2 3 2 2	1	1	7 7 7 7 6	5 1 5 1 1	21 13 19 14 12	
-25.00 - -24.01	2 1 1 2 2	1 1 1 1 1	7 5 7 5 5	1 1 1	1 1 1 2 1	6 6 6 6 6	4 2 5 2 2	27 16 22 19 17	
-24.00 - -23.01	4 1 1 1	2 1 1 1 1	7 4 6 3 4	2 2 1 3 2	3 2 3 2 2	9 5 5 5 5	7 4 7 4 4	33 20 25 20 19	
-23.00 - -22.01	3 1 1 1 1	3 3 3 3 3	5 3 6 4 3	4 4 4 4 4	8 2 2 4 2	5 5 4 5 5	5 2 6 2 3	30 20 26 23 21	
-22.00 - -21.01	4 3 3 3 3	4 4 4 4 4	3 3 3 3 3	5 7 6 6 6	6 5 5 4 5	5 4 4 4 4	5 3 6 3 3	33 27 30 27 28	
-21.00 - -20.01	4 2 2 2 2	3 2 2 2 2	3 3 3 3 3	2 1 2 2 2	5 5 5 6 5	5 4 4 4 4	2 3 3 3 3	24 20 21 23 21	
-20.00 - -19.01	5 2 2 2 3	3 2 2 2 2	2 2 2 2 2	4 4 4 4 4	3 3 3 2 2	7 5 5 5 5	3 3 3 3 3	27 23 24 24 23	
-19.00 - -18.01	4 2 2 3 2	3 2 2 2 2	3 3 4 3 3	4 4 4 4 4	4 4 4 4 4	6 4 4 4 4	4 4 4 4 4	28 23 27 24 23	
-18.00 - -17.01	3 2 2 2 2	3 3 3 3 3	3 3 4 3 3	6 6 6 8 6	5 5 5 5 6	9 7 7 7 7	3 3 3 3 3	31 27 30 31 30	
-17.00 - -16.01	2 4 3 4 3	3 3 3 3 3	3 3 3 3 3	5 5 5 5 5	4 4 4 4 4	6 5 5 5 5	3 3 3 3 3	26 27 26 27 26	
-16.00 - -15.01	2 1 2 2 2	2 2 2 2 2	4 4 5 4 4	3 3 3 3 3	3 3 3 3 3	6 4 5 5 4	4 3 3 3 3	24 20 23 22 21	
-15.00 - -14.01	2 2 2 1 2	1 1 1 1 1	5 5 5 6 5	4 4 4 4 4	5 5 5 6 5	6 3 3 5 3	5 4 4 5 4	28 24 24 28 24	
-14.00 - -13.01	3 3 2 2 2	5 5 5 5 5	4 4 4 3 5	5 4 4 4 4	8 8 8 7 8	4 4 4 4 4	4 4 5 4 4	32 31 32 29 32	
-13.00 - -12.01	2 2 2 2 2	2 2 2 2 2	2 2 2 2 2	3 8 8 7 8	8 9 9 12 9	4 4 4 4 4	4 3 3 3 3	30 30 30 32 30	

TABLE NO. 2

NRC CONCERN NO. 7

ANALYSIS OF SOIL INSPECTION REPORTS

ELEVATION	FILL 1 FORM NO 1	2	3	4	5	FILL 2 FORM NO 1	2	3	4	5	FILL 3 FORM NO 1	2	3	4	5	FILL 4 FORM NO 1	2	3	4	5	FILL 5 FORM NO 1	2	3	4	5	FILL 6 FORM NO 1	2	3	4	5	FILL 7 FORM NO 1	2	3	4	5	TOTALS FORM NO 1	2	3	4	5	COMMENTS
-12.00 ~ -11.01	3	3	3	2	3	1	1	1	1	1	8	8	8	8	9	6	7	7	7	7	7	6	6	5	6	3	3	3	3	3	7	7	7	6	7	35	35	35	26	36	* NOT REQUIRED
-11.00 ~ -10.01	3	3	3	3	3	3	1	2	2	2	3	3	3	3	4	16	11	12	10	11	5	5	5	3	5	6	7	7	7	7	3	4	4	5	6	39	39	36	33	38	
-10.00 ~ -9.01	3	3	3	3	3	2	2	2	2	2	8	9	10	9	9	5	9	14	12	11	6	6	6	5	6	5	5	5	5	5	3	8	8	8	8	32	42	48	44	51	
-9.00 ~ -8.01	2	2	2	2	1	4	4	4	4	4	6	5	6	5	5	3	9	9	9	8	4	4	4	4	4	7	7	9	7	7	1	7	5	7	7	36	38	39	38	36	
-8.00 ~ -7.01	6	8	9	8	9	2	2	2	2	2	6	7	6	8	6	12	10	11	12	12	4	5	5	4	5	4	4	4	5	4	1	4	5	5	4	26	41	42	45	42	
-7.00 ~ -6.01	4	4	3	4	4	4	4	4	4	4	7	11	13	11	11	3	4	4	4	4	6	2	2	2	2	6	8	8	8	7	2	5	4	4	5	32	28	28	37	37	
-6.00 ~ -5.01	6	6	6	5	6	5	5	5	3	5	10	10	10	10	10	10	11	11	11	10	5	4	4	4	4	7	7	7	7	6	4	5	7	5	5	47	48	50	45	46	
-5.00 ~ -4.01	2	2	3	4	3	3	5	4	4	3	8	8	8	8	9	15	14	14	14	14	7	8	6	4	8	7	10	9	11	10	3	10	12	10	9	44	56	55	57	55	
-4.00 ~ -3.01	4	5	5	4	5	2	4	4	4	4	6	10	10	10	10	12	12	12	15	14	4	3	4	3	4	7	12	10	13	12	7	12	11	14	12	42	58	56	62	61	
-3.00 ~ -2.01	5	5	5	4	5	5	5	5	5	4	8	18	17	17	17	9	10	10	10	9	3	3	3	3	3	6	9	7	8	9	4	15	13	15	10	29	65	60	72	57	
-2.00 ~ -1.01	7	7	7	7	7	4	4	4	4	3	7	20	20	21	21	7	9	10	10	11	4	4	4	4	4	7	10	9	13	10	2	13	7	13	11	32	68	61	73	68	
-1.00 ~ -0.01	10	11	11	11	11	5	5	5	5	5	7	17	18	16	18	12	13	12	11	12	6	6	6	7	6	7	10	3	10	10	2	14	12	14	12	49	75	71	73	73	
0.00 ~ +0.99	4	6	6	6	6	3	2	2	2	2	3	19	14	16	16	3	4	2	4	4	9	7	8	7	8	7	12	8	14	11	2	12	8	13	7	31	61	48	62	54	
1.00 ~ +1.99	10	10	10	13	11	7	6	6	6	6	10	17	15	12	15	7	9	9	9	9	12	11	10	10	10	5	14	11	15	15	2	15	11	14	10	53	82	72	73	76	
2.00 ~ 2.99	7	9	9	9	9	4	3	3	5	3	8	16	18	18	17	7	9	6	6	7	5	5	5	5	6	9	16	13	17	14	2	13	7	12	10	43	71	61	72	66	
3.00 ~ 3.99	8	9	9	8	9	5	5	5	5	5	7	23	24	23	23	7	8	8	9	7	8	8	8	8	7	10	19	11	20	18		15	7	14	12	45	86	72	87	81	
4.00 ~ 4.99	8	10	11	9	8	4	4	4	4	4	16	14	15	15	13	7	6	6	7	6	11	10	11	11	10	8	16	11	17	12	1	16	8	15	12	45	76	66	79	65	
5.00 ~ 5.99	5	5	5	5	5	4	3	3	3	3	4	17	17	17	16	9	9	8	9	8	8	7	7	7	7	8	20	12	21	17		19	11	19	9	39	80	63	81	65	
6.00 ~ 6.99	9	11	11	12	9	3	4	3	4	3	2	20	18	21	17	4	4	4	4	4	10	4	3	6	4	13	21	11	24	16		20	11	20	12	45	84	61	91	65	
7.00 ~ 7.99	5	7	5	9	4	5	4	3	6	4	6	21	17	22	16	6	4	4	4	4	7	4	3	6	3	16	23	14	28	12		22	9	21	8	45	90	55	95	48	
8.00 ~ 8.99	4	6	5	6	4	5	5	1	5	1	4	21	15	20	13	6	7	6	7	6	6	7	6	10	6	20	28	13	27	8		21	6	23	5	45	98	52	93	42	
9.00 ~ 9.99	5	5	5	6	3	4	4	2	4	*	5	28	19	20	15	7	6	6	7	4	7	12	6	9	8	21	36	15	26	8		21	6	22	6	42	112	55	113	44	
10.00 ~ 10.99	7	7	2	8	2	4	5	2	4	*	5	30	19	20	14	7	7	4	7	5	2	10	5	10	4	27	44	12	43	7		22	8	23	4	50	125	50	136	36	
11.00 ~ 11.99	7	9	4	9	2	8	9	3	9	*	5	25	13	25	8	7	13	8	12	9	4	9	3	8	3	24	58	14	59	5	2	13	8	14	2	65	166	53	165	29	
12.00 ~ 12.99	5	8	6	8	3	5	8	2	8	*	8	28	12	27	6	6	15	10	16	6	6	10	5	13	9	25	61	10	50	3	4	17	4	20	*	50	167	42	170	21	
13.00 ~ 13.99	5	10	2	10	2	4	11	2	12	*	6	22	5	20	2	3	17	7	12	5	3	6	4	6	3	25	66	7	66	2	3	27	3	27		42	165	30	160	14	
14.00 ~ 14.99	6	11	2	13	1	7	13	4	10	2	5	12	5	11	1	6	11	6	13	5	7	10	6	10	4	17	38	3	38	2	*	2	*	2	*	48	97	26	97	15	
15.00 ~ 15.99	6	14	1	14	1	7	13	2	11	1	6	9	3	9	*	7	20	5	20	5	3	7	2	7		12	28	3	24	2	*		*		*	18	21	16	25	9	
16.00 ~ 16.99	3	10	2	10	2	2	13	2	1	1	6	7	3	7	*	2	13	4	12	3	2	6	1	6		9	17	2	16	2	*		*		*	6	4	2	3	1	
17.00 ~ 17.99		2	1		*	2	2	2		1	*		*		*			*		*			*		*	3	7	2	8	2			*		*	6	11	5	8	3	
18.00 ~ 18.99			*		*			*		*			*		*			*		*			*		*			*		*			*		*					
19.00 ~ 19.99			*		*			*		*			*		*			*		*			*		*			*		*			*		*					
20.00 ~ 20.99			*		*			*		*			*		*			*		*			*		*			*		*			*		*					
SUB TOTAL	221	246	192	225	187	176	186	120	181	15	205	257	204	256	225	301	346	205	366	286	256	236	217	252	213	537	701	440	809	336	180	170	295	307	243	990	2452	2073	2546	1809	
TOTAL	1101					787					2360					1594					1206					3026					1695					11769					

TABLE NO. 3

NRC CONCERN NO. 7

ANALYSIS OF SOIL-INSPECTION REPORTS BY FILL SURFACE AREA (FT^2)

ELEVATION	FILL NO.							TOTAL SURFACE AREA (FT^2)		% COVERAGE BY	COMMENTS
	1	2	3	4	5	6	7	INSPECTION REPORTS	DENSITY OVERLAYS	INSPECTION REPORTS	
-44.00 ~ -43.01	*	*	*	*	*	*	*		N/A	–	* NOT REQUIRED
-43.00 ~ -42.01	*	*	*	*	*	4700	100	4800	N/A	–	
-42.00 ~ -41.01	*	*	Δ	200	*	3500	100	3800	N/A	–	Δ APPROPRIATE
-41.00 ~ -40.01	Δ	*	25800	200	*	2450	100	28950	N/A	–	INSPECTION REPORTS
-40.00 ~ -39.01	6800	*	25800	10800	Δ	5900	14600	63900	55000	116	MISSING.
-39.00 ~ -38.01	6800	Δ	26100	300	Δ	10050	48700	91950	65000	141	
-38.00 ~ -37.01	300	Δ	30500	10300	500	2200	45600	89400	71800	125	
-37.00 ~ -36.01	1550	300	27700	10600	850	5400	60900	107300	80000	134	
-36.00 ~ -35.01	16350	1700	84600	1000	1500	19200	61300	185650	94000	198	
-35.00 ~ -34.01	32000	7700	48000	400	500	8000	42200	138800	108000	129	
-34.00 ~ -33.01	16000	7700	29500	5000	7150	33700	61500	160550	99000	155	
-33.00 ~ -32.01	2000	2300	29000	5000	18000	33000	70000	159300	108000	148	
-32.00 ~ -31.01	16000	7700	30500	8450	17500	21000	50500	151650	114000	133	
-31.00 ~ -30.01	15000	16700	50000	5000	17500	4000	60500	168700	131800	128	
-30.00 ~ -29.01	15000	16700	41000	2500	17500	62000	60500	215200	146000	147	
-29.00 ~ -28.01	16000	25700	43000	5000	35000	35000	51500	211200	133000	160	
-28.00 ~ -27.01	16000	9000	77200	9700	35000	21000	14500	182400	158000	115	
-27.00 ~ -26.01	16000	9000	54000	5000	35000	35750	73500	228250	163000	140	
-26.00 ~ -25.01	16000	9000	47500	9850	18000	17728	68500	186600	168000	111	
-25.00 ~ -24.01	2100	9900	52000	5000	69500	39928	72500	250950	181000	139	
-24.00 ~ -23.01	3000	2950	95100	70600	68250	70000	57000	366800	183000	200	
-23.00 ~ -22.01	4100	5600	54000	47100	33750	58000	57000	259550	197300	132	
-22.00 ~ -21.01	5000	5600	52500	41000	67500	34200	57000	262800	219800	120	
-21.00 ~ -20.01	5000	4800	62000	37500	101500	12300	57000	270100	238500	113	
-20.00 ~ -19.01	4600	3700	52500	36300	71500	3000	57000	228600	247900	92	
-19.00 ~ -18.01	2600	3700	52500	43800	35150	39700	40000	218050	265700	82	
-18.00 ~ -17.01	3700	3700	52500	36500	37700	14900	58200	207200	261500	79	
-17.00 ~ -16.01	7600	3700	112000	41000	35700	11600	15000	226600	275400	82	
-16.00 ~ -15.01	2600	3700	112000	37000	35700	39100	47000	227100	304100	91	
-15.00 ~ -14.01	2000	2800	96950	38100	51000	12800	14300	223950	293500	76	
-14.00 ~ -13.01	46500	10000	69500	51000	50500	40000	47800	315350	298000	106	
-13.00 ~ -12.01	21300	16500	69500	47000	10000	60000	25700	250000	316500	79	

TABLE NO. 3

NRC CONCERN NO. 7

ANALYSIS OF SOIL-INSPECTION REPORTS BY FILL SURFACE AREA (FT^2)

ELEVATION	FILL NO.							TOTAL SURFACE AREA (FT^2)		% COVERAGE BY	COMMENTS
	1	2	3	4	5	6	7	INSPECTION REPORTS	DENSITY OVERLAYS	INSPECTION REPORTS	
-12.00 ~ -11.01	4500	30000	49500	56000	38000	35000	55700	268700	461000	58	
-11.00 ~ -10.01	3800	18000	77500	69400	38000	64000	66000	336700	369000	91	
-10.00 ~ -9.01	57000	18000	88500	79800	37500	104500	92000	477300	326500	146	
-9.00 ~ -8.01	32000	18000	128500	79000	37500	94000	103000	492000	327000	150	
-8.00 ~ -7.01	19000	27000	109000	138000	19500	63000	62000	437500	325500	134	
-7.00 ~ -6.01	35000	41000	86500	113700	14100	78000	96500	464800	332000	140	
-6.00 ~ -5.01	34000	39000	114800	95000	38000	136000	48500	505300	415500	122	
-5.00 ~ -4.01	70500	18500	110200	85300	10000	136350	108600	539450	421500	128	
-4.00 ~ -3.01	81500	8500	73950	105100	10500	140850	87600	508000	427800	119	
-3.00 ~ -2.01	72000	27500	89300	94900	10500	162050	71900	528150	439500	120	
-2.00 ~ -1.01	78000	9500	94450	110500	13100	98350	81000	484900	444000	109	
-1.00 ~ -0.01	16000	20500	96100	139300	46200	119250	47000	484350	469800	103	
0.00 ~ 0.99	138000	44100	131500	108800	47200	128300	75900	673800	484600	139	
1.00 ~ 1.99	137800	34500	131050	146000	47200	187400	65300	749250	484000	155	
2.00 ~ 2.99	117700	32600	148650	148700	40900	128600	77300	694450	456800	152	
3.00 ~ 3.99	118400	14600	168150	151000	48000	187700	85000	772850	429800	180	
4.00 ~ 4.99	35800	11400	167800	130100	56900	80150	46300	529050	458000	116	
5.00 ~ 5.99	41000	24400	226900	88600	69500	95150	90700	636250	464500	137	
6.00 ~ 6.99	32900	64600	219000	113600	88500	103500	80200	702300	451700	155	
7.00 ~ 7.99	36700	55800	148200	116000	48850	152550	41900	600000	445100	135	
8.00 ~ 8.99	46800	92500	142300	104500	58150	140950	119700	705000	397200	177	
9.00 ~ 9.99	106200	86000	147600	145500	22800	151350	76200	735650	361700	203	
10.00 ~ 10.99	126800	174000	82200	136000	26600	133950	104100	783650	342700	228	
11.00 ~ 11.99	133100	134000	98600	126600	29100	191850	83800	797050	397700	200	
12.00 ~ 12.99	101000	142500	78100	69000	22000	159900	93400	665900	319700	208	
13.00 ~ 13.99	279100	146250	61300	150900	33000	250000	93100	1013650	556900	284	
14.00 ~ 14.99	75800	74400	66100	28400	8000	82450	73000	408150	303500	134	
15.00 ~ 15.99	84000	77050	36900	90400	8500	101450	*	398300	275000	145	
16.00 ~ 16.99	56750	51500	28800	16450	8500	53400	*	215400	281300	76	
17.00 ~ 17.99	*	*	*	*	*	*	*	37650	N/A	-	
18.00 ~ 18.99	*	*	*	*	*	*	*	N/A	N/A	-	
19.00 ~ 20.99	*	*	*	*	*	*	*	N/A	N/A	-	
SUB TOTAL	2473050	1725850	4794600	3657775	1855000	4320750	3515800	22342825	16347200	137	

TABLE NO. 4

NRC CONCERN NO. 7

RELATIVE DISTRIBUTION OF INSPECTION REPORTS TO DENSITY TESTS

FILL NO	NO. OF INSPECTIONS	% OF TOTAL INSPECTIONS	NO OF DENSITY TESTS	% OF TOTAL DENSITY TESTS	COMPARATIVE %	
					INSPECTIONS	TESTS
1	1097	9.3	246	8.0	9.3	8.0
2	785	6.7	178	5.8	6.7	5.8
3	2360	20.1	570	18.5	20.1	18.5
4	1592	13.5	375	12.2	13.5	12,2
5	1198	10.2	336	10.9	10.2	10.9
6	3026	25.8	826	26.9	25.8	26.9
7	1694	14.4	545	17.7	14.4	17.7
TOTAL	11752	100.0	3076	100.0	100.0	100.0

TABLE NO 5

NRC CONCERN NO 7

COMPARISON OF IN-PLACE DENSITY TEST FREQUENCY AND DISTRIBUTION

ELEVATION	FREQUENCY			DISTRIBUTION							NOTES
	SURFACE AREA	NO. OF TESTS		FILL NO							
		REQ'D	ACTUAL	1	2	3	4	5	6	7	
-44.00 - -40.01	N/A	N/A	(56)*	CLASS A FILL IN TRENCHES AND SUMP							
-40.00 - -39.01	55,000	3	32	5	0	2	1	4	18	2	
-39.00 - -38.01	65,000	4	44	5	0	7	5	7	13	7	
-38.00 - -37.01	71,800	4	75	7	6	7	4	9	16	26	
-37.00 - -36.01	80,000	4	49	6	3	6	6	9	12	7	
-36.00 - -35.01	94,000	5	38	2	2	9	3	6	11	5	
-35.00 - -34.01	108,000	6	18	1	1	5	1	4	3	3	
-34.00 - -33.01	99,000	5	13	0	1	2	1	2	3	4	
-33.00 - -32.01	108,000	6	17	1	1	3	1	2	4	5	
-32.00 - -31.01	114,000	6	18	1	2	4	1	2	2	6	
-31.00 - -30.01	131,800	7	21	1	0	4	1	5	6	4	
-30.00 - -29.01	146,000	8	21	0	1	9	1	2	5	3	
-29.00 - -28.01	133,000	7	15	1	1	2	1	1	4	5	
-28.00 - -27.01	158,000	8	14	1	1	2	1	3	4	2	
-27.00 - -26.01	163,000	9	17	1	1	3	1	2	4	5	
-26.00 - -25.01	168,000	9	16	1	2	2	0	0	7	4	
-25.00 - -24.01	181,000	10	15	1	1	4	1	1	5	2	
-24.00 - -23.01	183,000	10	17	1	1	4	2	3	3	3	
-23.00 - -22.01	197,300	10	23	1	1	3	3	8	4	3	
-22.00 - -21.01	219,800	11	24	4	2	3	5	6	3	3	
-21.00 - -20.01	238,500	12	19	2	1	2	3	5	3	3	
-20.00 - -19.01	247,900	13	20	2	1	3	3	4	4	3	
-19.00 - -18.01	265,700	14	22	1	1	3	5	5	3	4	
-18.00 - -17.01	261,500	14	26	2	1	3	5	6	6	3	
-17.00 - -16.01	275,400	14	25	3	3	3	5	4	4	3	
-16.00 - -15.01	304,100	16	22	2	1	4	3	5	4	3	
-15.00 - -14.01	293,500	15	28	3	1	6	4	6	4	4	
-14.00 - -13.01	298,000	15	29	0	3	4	6	8	4	4	
-13.00 - -12.01	316,500	16	27	2	2	2	8	7	4	2	
-12.00 - -11.01	461,000	24	36	3	1	8	8	6	3	7	
-11.00 - -10.01	369,000	19	36	3	2	3	9	8	10	1	
-10.00 - -9.01	326,500	17	43	2	2	9	10	6	6	8	
-9.00 - -8.01	327,000	17	38	3	4	6	8	3	7	7	
-8.00 - -7.01	325,500	17	40	6	2	6	12	5	5	4	
-7.00 - -6.01	332,000	17	40	4	2	10	6	6	7	5	

TABLE NO 5

NRC CONCERN NO 7

COMPARISON OF IN PLACE DENSITY TEST FREQUENCY AND DISTRIBUTION

ELEVATION	FREQUENCY			DISTRIBUTION							NOTES
	SURFACE AREA	NO. OF TESTS		FILL NO							
		REQ'D	ACTUAL	1	2	3	4	5	6	7	
-6.00 ~ -5.01	415,500	21	48	6	4	9	8	5	9	7	
-5.00 ~ -4.01	421,500	22	60	4	3	12	15	5	10	11	
-4.00 - 3.01	427,800	22	53	3	3	11	12	1	10	13	
-3.00 - 2.01	439,500	22	65	6	3	20	10	5	10	11	
-2.00 - 1.01	444,000	23	61	7	4	18	10	1	9	12	
-1.00 - -0.01	469,800	24	79	14	5	17	12	10	10	11	
0.00 ~ +0.99	484,600	25	73	8	5	16	9	10	11	14	
+1.00 ~ +1.99	484,000	25	72	8	4	20	9	6	11	14	
+2.00 ~ +2.99	456,800	23	93	9	3	26	9	8	20	18	
+3.00 ~ +3.99	429,800	22	80	7	5	14	5	11	21	17	
+4.00 ~ +4.99	458,000	23	82	5	4	16	10	5	23	16	
+5.00 ~ +5.99	464,500	24	80	7	2	17	5	9	21	19	
+6.00 ~ +6.99	451,700	23	83	6	5	22	8	7	19	16	
+7.00 ~ +7.99	446,100	23	86	7	3	18	6	5	28	19	
+8.00 ~ +8.99	397,200	20	96	3	4	23	8	7	27	24	
+9.00 ~ +9.99	361,700	19	111	4	5	26	8	9	40	19	
+10.00 ~ +10.99	342,700	18	133	7	5	24	10	10	43	34	
+11.00 ~ +11.99	397,700	20	156	7	8	24	12	10	57	38	
+12.00 ~ +12.99	319,700	16	174	7	8	22	15	9	71	42	
+13.00 ~ +13.99	256,000	13	78/92 *	9	11	22	12	11	71	27	
+14.00 ~ +14.99	303,600	16	57/60 *	12	12	13	13	6	38	3	
+15.00 ~ +15.99	275,000	14	56/64 *	14	15	13	17	10	31	0	
+16.00 ~ +16.99	281,300	15	72/43 *	8	2	10	13	10	22	0	
+17.00 ~ +17.99	240,000	13	3/18 *	0	1	4	0	3	13	0	
+18.00 ~ +21.00	N/A	N/A	5 *								
SUB-TOTALS	6581,200 FT²	858	2704/2762	246	178	570	375	336	826	545	
VOL. OVER-EX	614,300 YD³	EL -4 ~ -0	56			3076					
VOL. DESIGN DY.G	462,000	EL +18 ~ +21	5								
	133 %										
TOTALS		858	3137								
* - % COMPACTION - NOT PART OF STATISTICAL STUDY - SEE STATISTICAL STUDY NO. 7 FOR DETAILS											

TABLE NO 6
NRC CONCERN NO 7

FREQUENCY CHECK - PROCTORS/SIEVES TO DENSITIES

PROCTOR CURVE NO	LAB TEST NO.	NO. OF DEN TESTS BETW PROCTORS
1	LRNE 717,718,719	17
2	768	22
6	788	5
3	809	12
3A	815	4
7	817	1
5	935	29
11	945	8
12	952	6
13	959	6
14	971	11
15	985	4
16	1002	11
17	1014	10
18	1021	6
19	1032	11
19A	1039	5
INDY	1040	0
22	B0005A	4
26	15	9
27	22	6
INDY	23	0
28	31	5
29	42	10
30	47	5
INDY	50	2
31	52	1
32	62	9
33	69	5
34	77	7
INDY	78	0
35	87	8
36	94	6
37	106	10
38	117	9
39	129	11
40	139	9
41	149	9
42	161	12
44	170	8
43	172	1
45	184 (CLAY)	11
46	184 (SAND)	0
47	196	10
48	210	13
49	220	9
50	231	10
51	251	19
52	255 CORRELATION	3
53	256 INDY	0
54	266	9
55	271	4
56	272	0
58	281	8
59	291	9
60	302	10
61	312	8
63	326	10
64	335	8
65	346	6
66	356	5
67	366	7
67A	374	2
68	376	1
69	377 INDY	0
70	387	7
71	→ B0041M	
72	397	8
73	408	8
74	419	8
75	429	8
76	439	8
77	443	3
78	~~444~~ (INDY)	0
79	452	7
82	465	9
84	476	10
86	494	15
87	500	4
90	520	17
91	526	5
92	532	4
93	533 INDY	0
94	543	7
97	556	11
98	566	7
100	579	11
102	505	5
105	595	9
106	605	8
108	613	6
109	620	6
110	621 INDY	0
112	633	10
113	643	8
115	653	9
117	663	9
118	673	6
120	683	9

TABLE NO 6
NRC CONCERN NO 7
FREQUENCY CHECK - PROCTORS/SIEVES TO DENSITIES

PROCTOR CURVE NO	LAB TEST NO.	NO. OF DEN TESTS BETW PROCTORS
122	694	9
123	701	5
125	713	10
127	723	8
128	737	9
130	746	8
131	759	10
132	770	9
133	781	10
134	793	10
135	804	10
137	816	10
138	826	8
139	837	10
140	848	9
141	855 INDY	6
142	856 (CORRELATION)	0
144	867	9
146	878	9
148	891	9
149	904	10
150	915	9
151	927	10
152	940	10
153	953	10
154	961	7
155	973	9
156	983	9
157	996	9
158	1007	10
159	1016	8
160	1027	9
163	1040	10
164	1052	10
165	1063	9
166	1076	10
167	1087A	9
200	1087AA	7 (INDY)
168	1100	3
172	1148	12
173	1160	10
174	1173	10
175	1186	8
177	1197	9
178	1211	10
180	1223	10
183	1234	10
184	1246	9
185	1259	10
186	1270	10
187	1283	10
188	1294	10
189	1305	10
190	1311	3
191	1312	0
195	1319	6
192	1321	1 (INDY)
193	1322	0 (CORRELATION)
196	1332	9
197	1344	10
198	1357	10
199	1370	10
201	1382	10
202	1393	10
203	1405	10
205	1417	10
206	1429	10
207	1441	10
208	1453	10
190	1465	10
191	1476	9
209	1482	4
193	1488	5
210	1500	10
191	1512	10
211	1524	10
212	1538	10
213	1550	11
214	1562	10
215	1574	10
217	1588	10
218	1601	10
219	1613	10
220	1625	3
222	1639	9
223	1651	10
224	1663	10
226	1677	10
227	1689	7
228	1701	9
229	1712	10
231	1724	10
232	1735	9
233	1747	10
235	1758	9
236	1784	0 (CORRELATION
237	1771	10
238	1782	10
239	1796	10

TABLE NO 6
NRC CONCERN NO 7

FREQUENCY CHECK - PROCTORS/SIEVES TO DENSITIES

PROCTOR CURVE NO	LAB TEST NO.	NO. OF DEN TESTS BETW PROCTORS
240	1807	10
241	1819	10
243	1831	9
244	1842	10
245	1853	10
246	1865	10
247	1877	10
248	1889	10
249	1901	10
250	1912	10
251	1922	9
252	1934	10
253	1945	10
254	1957	10
255	1968	10
256	1980	10
257	1991	10
258	2004	10
259	2015	10 (CORRELATION)
260	2026	10 (INDY)
261	2027	0
262	2038	10
263	2050	10
264	2063	11
265	2074	9
266	2086	10
267	2098	10
268	2109	10
269	2121	10
270	2132	10
271	2144	8
273	2156	10
274	2169	10
275	2181	10
277	2194	10
278	2206	10
280	2219	10
283	2231	10
285	2245	10
287	2258	9
288	2263	3
289	2268	3
290	2273	3 (CORRELATION)
291	2274	0 (INDY)
292	2286	10
293	2287	0 (INDY)
295	2300	10
296	2312	10
297	2324	10
299	2336	10
300	2350	10
301	2364	9
305	2379	8
307	2392	10
309	2405	10
314	2418	10
316	2430	10
317	2443	10
318	2456	10
319	2468	10
320	2481	10
321	2493	10
322	2506	10
323	2519	10
324	2534	10
325	2535	0 (CORRELATION ONLY)
326	2548	10
328	2561	10
329	2573	10
330	2578	3
331	2586	7
333	2598	10
334	2610	10
336	2623	10
337	2635	10
341	2648	9
342	2659	10
344	2671	10
346	2683	10
347	2695	10
349	2706	10
350	2717	10
351	2730	10
353	2742	10
354	2754	10
356	2767	10
357	2779	10
358	2791	10 (CORRELATION)
359	2792	0 (INDY)
361	2805	10
362	2818	10
365	2831	10
367	2843	10
369	2855	10
372	2867	10
373	2879	10
375	2892	10
376	2904	10
379	2917	10

TABLE NO 6
NRC CONCERN NO 7
FREQUENCY CHECK - PROCTORS/SIEVES TO DENSITIES

PROCTOR CURVE NO	LAB TEST NO.	NO. OF DEN TESTS BETW PROCTORS
380	2929	10
382	2941	10
383	2953	10
386	2967	11
391	2978	9
392	2990	10
393	3002	10
396	3014	10
397	3027	10
400	3053	24 (CORRELATION TO INDY)
404	3065	10
405	3076	6
409	3088	10
410	3099	10
412	3110	10
415	3121	10
416	3154	10/10/10 REUSED MATL
418	3165	10
421	3176	10
422	3187	10
423	3198	10
425	3209	10
426	3220	10
428	3231	10
429	3242	10
430	3253	10
431	3264	10
432	3275	10
434	3286	10
439	3297	10 (MEMPHIS)
441	3308	10
445	3319	10
447	3330	10
449	3341	10
451	3352	10
452	3363	10
453	3374	10
454	3385	10
455	3396	10
456	3407	10
457	3418	10
459	3430	11
460	3443	12
471	3454	10
473	3464	9
474	3474	9
475	3482	7
481	3493	10
485	3506	10
488	3509	3
488A	3522	12
490	3538	13
493	3547	5
493	3548	0
498	3556	6
499	3569	7
500	3576	4
503	3581	3
504	3582	11
505	3589	4
506	3592	12
507	3600	10
508	3601	10
509	3628	9
	END	

PROCTOR CURVE NO	LAB TEST NO	NO OF DEN TESTS BETW PROCTORS

TABLE NO. 7
NRC CONCERN NO. 7

NONCONFORMING INTERVALS · PROCTOR/SIEVE TO FIELD DENSITY

PROCTOR CURVE NO	LAB TEST NO.	NO OF DEN TESTS BETW PROCTORS	PROCTOR CURVE NO	LAB TEST NO	NO OF DEN-TESTS BETW PROCTORS	PROCTOR CURVE NO	LAB TEST NO	NO OF DEN. TESTS BETW. PROCTORS
14	LRWE 271	11	42	B0161A	12	1	LRWE 717,718,719	17
16	1002	11	172	1148	12	2	768	22
19	1032	11	460	3443	12	5	935	29
39	B0129A	11	488A	3552	12	51	B0251A	19
45	184	11	506	3592	12	86	494	15
97	556	11	3	LRWE B09	12	90	526	17
106	579	11				400	3053	24
213	1550	11	48	B0210A	13			
386	2967	11	490	3538	13			
459	3430	11						
504	3582	11						
264	2063	11						

TABLE NO 8

NRC CONCERN NO. 7

ANALYSIS OF NONCONFORMING CONTROL TEST FREQUENCIES

PROCTOR CURVE	LAB TEST NO	LOCATION	FILL NO	TEST ELEV	DATE	RELATIVE DENSITY
1	LRWE 699	F4 45W 0N	5B	-41.6	1-21-76	78
	700	F4 80W 28S	5B	-39.6	1-21-76	72
	701	F4 44W 21S	5B	-40.3	1-21-76	74
	702	F4 40W 16N	5B	-39.0	1-21-76	84
	703	F4 70W 17N	5B	-38.3	1-21-76	79
	704	F4 43W 10S	5B	-37.7	1-21-76	78
	705	F4 42W 10N	5B	-36.4	1-22-76	78
	706	F4 78W 5S	5B	-36.4	1-22-76	66
	707	E2 6E 14S	4	-36.4	1-22-76	66
	708	D2 10W 16S	4	-35.1	1-22-76	75
	711	F4 5N 80W	5B	-35.1	1-22-76	68
	710	F4 9S 57W	5B	-35.1	1-22-76	87
	712	E2 15S 7E	4	-41.25	1-23-76	72
	713	E2 6W 5S	4	-41.25	1-23-76	73
	714	F4 45N 44W	5B	-34.75	1-23-76	72
	715	F4 49W 3N	5B	-34.75	1-23-76	82
	716	F4 61W 12S	5B	-34.75	1-23-76	68

TABLE NO 8

NRC CONCERN NO. 7

ANALYSIS OF NONCONFORMING CONTROL TEST FREQUENCIES

PROCTOR CURVE	LAB TEST NO	LOCATION	FILL NO	TEST ELEV	DATE	RELATIVE DENSITY
2	LRWE 720	C2 20E 13S	1	- 39.75	1-26-76	62.5
	721	F4 45N 38W	5A	- 41.75	1-26-76	81
	723	D2 13W 13S	4	- 38.50	1-26-76	79
	724	F4 62N 43W	5A	- 40.50	1-26-76	79
	725	F3 7N 43W	5A	- 39.20	1-26-76	79
	726	F4 40W 53N	5A	- 39.20	1-27-76	77
	727	E6 35S 68E	3B	- 42.50	1-27-76	81
	731	E6 78N 68E	3B	- 42.50	1-27-76	97
	733	E6 22S 30W	3B	- 41.50	1-28-76	74
	734	E5 7N 32W	3B	- 41.50	1-28-76	81
	736	F5 20S 33W	3B	- 41.50	1-28-76	85
	754	B3 20E 30S	6B	- 43.25	2-11-76	72
	755	B4 20E 31S	6B	- 42.25	2-11-76	72
	757	B4 30N 35E	2	- 38.00	2-12-76	97
	758	B4 0N 55E	2	- 38.00	2-12-76	95
	759	B4 37S 53E	6B	- 38.00	2-12-76	92
	760	B4 22S 33E	6B	- 36.75	2-12-76	73
	761	B4 7N 52E	2	-36.50	2-12-76	68
	762	B4 18S 56E	6B	-36.75	2-12-76	83
	763	B4 10S 37E	6B	-35.50	2-12-76	84
	766	B4 29S 55E	6B	-35.50	2-13-76	88
	767	B4 0N 50E	2	-35.50	2-13-76	84

TABLE NO 8

NRC CONCERN NO. 7

ANALYSIS OF NONCONFORMING CONTROL TEST FREQUENCIES

PROCTOR CURVE	LAB TEST NO	LOCATION	FILL NO	TEST ELEV	DATE	RELATIVE DENSITY
5	LRWE 818	F4 80W 85S	5A	-37.25	2-26-76	90
	819	E5 20N 30E	3B	-38.25	3-1-76	64
	820	C6 35S 10W	6A	-40.25	3-1-76	79
	821	E5 25N 32E	3B	-37.25	3-1-76	57
	822	E5 30N 30E	3B	-36.25	3-1-76	69
	848	C6 40S 35E	7	-38.25	3-17-76	71
	866	C2 37S 15W	1	-39.75	4-23-76	65
	865	B2 68S 42E	1	-39.75	4-23-76	55
	863	RETEST				71
	867	C2 15S 15E	1	-39.75	4-23-76	69
	869	C2 10S 8E	1	-38.75	4-26-76	80
	873	B2 53S 40E	1	-38.75	4-26-76	68
	875	B2 90E 50S	1	-37.50	4-27-76	59 *
	878	B2 40E 80S	1	-37.50	4-27-76	-
	911	E3 50N 5W	4	-40.25	5-18-76	69
	912	E3 54N 20W	4	-40.25	5-18-76	62 *
	913	E3 80N 30W	4	-39.25	5-19-76	69
	915	E3 51N 80W	4	-37.00	5-19-76	66
	917	E3 40N 81W	4	-37.00	5-19-76	91
	918	E3 25S 50E	4	-37.25	5-20-76	80
	919	E3 27S 48W	4	-37.25	5-20-76	70
	920	D3 87N 30E	4	-35.75	5-20-76	61
	921	E3 37E 24N	5A	-36.25	5-20-76	84
	922	E3 25E 24N	5A	-36.25	5-20-76	60 *
	923	E3 60E 15N	5A	-35.25	5-21-76	88
	924	E3 28E 15N	5A	-35.25	5-21-76	84
	932	C6 35N 30W	6A	-39.25	6-2-76	65
	931	C6 47W 30N	6A	-39.25	6-2-76	74
	933	C6 52N 50W	6A	-38.25	6-3-76	60 *
	934	C6 0N 45W	6A	-37.25	6-3-76	61 *

* ACCEPTED AS PART OF STATISTICAL TOLERANCE

TABLE NO 8

NRC CONCERN NO. 7

ANALYSIS OF NONCONFORMING CONTROL TEST FREQUENCIES

PROCTOR CURVE	LAB TEST NO	LOCATION	FILL NO	TEST ELEV	DATE	RELATIV. DENSITY
51	B0232ARR	B6 91N 65E	6	-44.00	11-5-76	84.5
	233A	B6 94N 68E	6	-42.75	11-5-76	96.0
	234A	B6 97N 62E	6	-41.50	11-5-76	84.0
	235ARR	B6 91N 54E	6	-42.05	11-5-76	94.0
	236A	B5 3N 65E	6	-40.75	11-6-76	116.5
	237A	B5 6N 63E	6	-40.00	11-6-76	108.0
	238A	B6 90N 63E	6	-39.50	11-6-76	131.5
	239A	B6 93N 58E	6	-41.25	11-6-76	99.5
	240A	B6 93N 64E	6	-39.00	11-6-76	151.5
	241ARR	B5 4N 55E	6	-40.25	11-6-76	140.5
	242A	B6 98N 63E	6	-37.75	11-6-76	124.0
	243A	B6 93N 64E	6	-37.25	11-7-76	112.5
	244AR	B6 96N 55E	6	-39.50	11-7-76	92.0
	245AR	B5 3N 53E	6	-38.50	11-7-76	86.5
	246A	B6 94N 57E	6	-37.00	11-7-76	87.5
	247A	B5 18N 66E	6	-36.50	11-7-76	90.5
	248A	B6 45N 63E	6	-35.50	11-7-76	148.0
	249A	B5 3N 56E	6	-36.00	11-8-76	105.0
	250AR	B5 66N 65E	6	-37.25	11-8-76	92.5

TABLE NO 8

NRC CONCERN NO. 7

ANALYSIS OF NONCONFORMING CONTROL TEST FREQUENCIES

PROCTOR CURVE	LAB TEST NO	LOCATION	FILL NO	TEST ELEV	DATE	RELATIVE DENSITY
86	B0477A	E7 80N 96E	3	-27.30	3-16-77	88.5
	478A	E7 90N 25E	7	-30.30	3-16-77	68.5
	479A	F7 48N 0E	3	-26.30	3-17-77	88.0
	480A	E6 30N 55E	3	-26.30	3-17-77	79.0
	481A	E7 15S 15E	7	-29.30	3-17-77	77.0
	482A	E8 91N 33E	7	-28.30	3-17-77	72.0
	483A	D8 70N 62E	7	-32.30	3-17-77	67.5
	484A	D7 30S 12E	7C	-32.30	3-18-77	81.0
	485A	E7 0N 5E	7A	-26.30	3-18-77	93.5
	486A	E8 80N 33E	3B	-25.30	3-18-77	87.0
	487A	E7 55N 43E	7A	-25.30	3-18-77	79.0
	489A	D7 45S 24E	7C	-31.30	3-19-77	65.5
	490A	D7 25N 70E	7C	-29.30	3-19-77	70.0
	492A	C7 30N 10E	7E	-38.30	3-21-77	75.0
	493A	D7 11N 81E	7C	-28.30	3-21-77	—

TABLE NO 8
NRC CONCERN NO. 7
ANALYSIS OF NONCONFORMING CONTROL TEST FREQUENCIES

PROCTOR CURVE	LAB TEST NO	LOCATION	FILL NO	TEST ELEV	DATE	RELATIVE DENSITY
90	B0501A	C7 32N 67E	7E	-34.25	3-22-77	75.0
	502A	D7 12S 75W	7	-34.30	3-23-77	85.5
	503A	D7 ON OE	7	-33.30	3-23-77	99.0
	504A	C7 18N 96E	7	-32.30	3-23-77	97.0
	505A	C7 35N 51E	7	-31.30	3-23-77	83.0
	506A	C8 ON OE	7F	-31.05	3-24-77	—
	507A	C7 8S OE	7F	-30.30	3-24-77	81.5
	508A	D7 60W ON	7E	-30.30	3-24-77	74.5
	509A	B7 37N 96E	7E	-29.30	3-24-77	79.0
	510A	C8 92N 95E	7	-28.30	3-24-77	79.0
	511A	C7 2N 33E	7E	-27.30	3-25-77	74.0
	512A	D7 31N 11E	7E	-26.30	3-25-77	57.0
	513A	B6 90N 5E	6	-38.30	3-26-77	75.0
	515A.	C8 95N OE	7E	-25.30	3-28-77	91.5
	516A	B7 62N 38E	6A	-34.25	3-28-77	77.0
	517A	B7 53N 38E	6A	-33.25	3-28-77	112.0
	519A	B7 72N 20E	6	-33.30	3-29-77	66.0

TABLE NO 8

NRC CONCERN NO. 7

ANALYSIS OF NONCONFORMING CONTROL TEST FREQUENCIES

PROCTOR CURVE	LAB TEST NO	LOCATION	FILL NO	TEST ELEV	DATE	RELATIV DENSITY
400	B 3029A	F8 8N 18E	3	+12.50	8-1-78	102.5
	3030A	F8 5N 17E	3	+13.50	8-1-78	108.5
	3031A	F8 55N 5E	3	+14.00	8-1-78	106.0
	3032A	F8 2N 15E	3	+14.50	8-1-78	100.5
	3033A	F7 35N 25E	3	+13.00	8-2-78	104.5
	3034A	F7 20N 30E	3	+14.00	8-2-78	103.0
	3035A	B8 5N 5E	6	+10.00	8-9-78	113.0
	3036A	B8 40N 10E	6	+12.00	8-9-78	104.0
	3037A	B8 8N 5E	6	+11.00	8-9-78	106.0
	3038A	B8 45N 10E	6	+13.00	8-10-78	116.0
	3039A	B8 5N 0E	6	+12.00	8-10-78	101.5
	3040A	B8 48N 5E	6	+14.00	8-10-78	107.0
	3041A	B8 0N 4E	6	+13.00	8-10-78	106.0
	3042A	B8 30N 25E	6	+11.00	8-10-78	106.5
	3043A	B8 5N 6E	6	+14.00	8-10-78	102.5
	3044A	B8 30N 35E	6	+12.00	8-10-78	102.5
	3045A	B8 38N 28E	6	+13.00	8-11-78	112.0
	3046A	B8 38N 35E	6	+14.00	8-11-78	101.0
	3047A	B8 25N 5E	6	+6.00	8-11-78	102.5
	3048A	B8 20N 8E	6	+7.00	8-11-78	100.0
	3049A	B8 18N 3E	6	+8.00	8-11-78	102.5
	3050A	B8 15N 9E	6	+9.00	8-12-78	106.0
	3051A	B8 17N 2E	6	+10.00	8-12-78	97.5
	3052A	B8 12N 5E	6	+11.00	8-12-78	101.5

TABLE NO. 9
NRC CONCERN NO. 7
SCHEDULE OF RELATIVE DENSITY
CORRELATION TESTING

TEST NUMBER	TEST DATE
LRWE 815	2/25/76
1040	8/12/76
B 0023A	9/9/76
50A	9/22/76
78A	10/8/76
256A	11/9/76
271A	12/15/76
377A	2/2/77
444A	2/23/77
532A	4/1/77
621A	4/22/77
855A	5/31/77
1087A	7/7/77
1321A	8/5/77
1482A	8/19/77
1500A	8/20/77
1784A	9/28/77
2015A	10/18/77
2026A	10/18/77
2274A	11/17/77
2287A	11/22/77
2535A	2/23/78
2792A	5/23/78
3053A	8/21/78
3297A	2-16-79
1197B	12/17/79

REVIEW AND ANALYSIS OF SOIL
BACKFILL DENSITIES
NRC CONCERN NO. 7

APPENDIX A

IN-PLACE DENSITY TESTS FILL 5

EL -41.75 to EL -36.25

TABLE A-1

IN-PLACE DENSITY TESTS - FILL #5
EL -41.75 TO EL -36.25

TEST EVALUATION	TEST LOCATION	TEST NUMBER	TEST DATE	PROCTOR TEST CURVE NO.
-41.75	F4 45N 38W	LRWE721	1/26/76	1
-41.60	F4 0N 45W	LRWE699	1/21/76	1
-40.50	F4 62N 43W	LRWE724	1/26/76	1
-40.30	F4 21S 44W	LRWE701	1/21/76	1
-39.60	F4 28S 80W	LRWE700	1/21/76	1
-39.25	F4 20N 80W	LRWE808	2/24/76	6
-39.25	F4 18N 20W	LRWE807	2/24/76	6
-39.20	F4 53N 40W	LRWE726	1/27/76	1
-39.20	F3 7N 43W	LRWE725	1/26/76	1
-39.00	E3 30N 33E	LRW1031	8/12/76	15/18
-39.00	F4 16N 40W	LRWE702	1/21/76	1
-38.75	E4 10N 33E	LRW1036	8/12/76	15/18
-38.30	F4 17N 70W	LRWE703	1/21/76	1
-38.25	F4 30N 50W	LRWE811	1/26/76	3
-38.25	F4 35N 43W	LRWE812	2/25/76	3
-38.25	E4 10N 31E	LRW1037	8/12/76	15/18
-38.00	E3 31N 32E	LRW1033	8/12/76	15/18
-37.75	E3 31N 34E	LRW1035	8/12/76	15/18
-37.70	F4 10S 43W	LRWE704	1/21/76	1
-37.50	E4 11N 32E	LRW1038	8/12/76	15/18
-37.50	E4 69N 27E	B0102A	10/13/76	34
-37.25	F3 80S 70W	LRWE 813	2/26/76	6
-37.25	F4 80S 84W	LRWE 816	2/26/76	6
-37.25	F4 85S 80W	LRWE 818	2/26/76	6
-37.25	E5 40N 27E	B0089A	10/11/76	34
-37.00	E4 60N 27E	B0101AR9	10/14/76	34/36
-36.76	E4 60N 28E	B0110AR4	10/14/76	36
-36.75	E5 42N 37E	B0090AR2	10/12/76	34
-36.40	F4 15S 78W	LRWE706	1/22/76	1
-36.40	F4 10N 42W	LRWE705	1/22/76	1
-36.25	E4 45N 27E	B0116AR	10/15/76	36
-36.25	E3 24N 25E	LRWE922	5/20/76	7
-36.25	E3 24N 37E	LRWE921	5/10/76	2
-36.25	E5 58N 27E	B0097AR	10/12/76	34

Peabody Testing

In-Place Density Test-Rubber Balloon

Test Standard ASTM D2167 PB08-09

RE'EWED W3-6497 6-4

Project: Waterford SES Unit 3 Lab No. ~~B0019A~~ JBim 9.22-76 (LRWE 721)

Client: Ebasco Services Inc. Test No. 2

Test Location F4-45N, 38W Fill No. 5A

Test Depth ~~-41.75~~ W Burchett 6-25-76 Date 1/26/76

G.S. Elevation — Time of Test —

Test Elevation -41.75 Volumeter I.D. LRW 61

Sample I.D. MISS RIVER PUMP SAND Scale I.D. LRW 53

Speedy I.D. LRW ~~62~~ 62 MF 9-12-76

1. Wt. of Can & Damp Soil, 0.01 lb. 3.11
2. Tare Wt. of Can, 0.01 lb. .07
3. Net Wt. of Damp Soil, 0.01 lb. 3.04

Speedy Moisture, 7.2 %

4. Volume of Test Hole: .0264 ft^3

5. Tare No. —
6. Wt. Tare & Wet Soil, gm. —
7. Wt. Tare & Dry Soil, gm. —
8. Wt. Water, gm. —
9. Wt. Tare, gm. —
10. Wt. of Dry Soil, gm. —
11. Moisture Content (8/10) — %

Retest Required: ____ Yes ✓ No

Retest of Lab No. — & Date —

Specification Requirement of Compaction 95.0 %

☑ Meets ☐ Does Not Meet Spec.

Moisture Content	Wet Density	Dry Density	Reference Curve No.	Maximum Density	Optimum Moisture	Degree of Compaction
7.2 %	115.2 lb/ft^3	107.5 lb/ft^3	1	105.6 lb/ft^3	13.0 %	101.8 %

Remarks:

Technician: T Hazel Calculated By: T Hazel Checked By: [signature]

Emp. No.: 3182 Emp. No.: 3182 Emp. No.: 3445

JRM

Peabody Testing

In-Place Density Test-Rubber Balloon

Test Standard ASTM D2167 PB08-09

REVIEWED W3-6497

Project: Waterford SES Unit 3 Lab No. JRM 9-22-76 ~~B0001A~~ (LRWE699)

Client : Ebasco Services Inc. Test No. 1

Test Location F4-45W, ON Fill No. 5B

Test Depth ~~41.60~~ 6-29-76 Date 1/21/76

G.S. Elevation — Time of Test —

Test Elevation -41.60 Volumeter I.D. LRW61

Sample I.D. MISS RIVER Scale I.D. LRW-53

DUMP SAND Speedy I.D. LRW-62

1. Wt. of Can & Damp Soil, 0.01 lb. 3.98
2. Tare Wt. of Can, 0.01 lb. .07
3. Net Wt. of Damp Soil, 0.01 lb. 3.91

Speedy Moisture, 8.8 %

4. Volume of Test Hole: .0364 ft³

5. Tare No. --
6. Wt. Tare & Wet Soil, gm. —
7. Wt. Tare & Dry Soil, gm. —
8. Wt. Water, gm. —
9. Wt. Tare, gm. —
10. Wt. of Dry Soil, gm. —
11. Moisture Content (8/10) — %

Retest Required: ____ Yes ✓ No

Retest of Lab No. —

& Date —

Specification Requirement of Compaction 95 %

☐ Meets ☑ Does Not Meet Spec.

Moisture Content	Wet Density	Dry Density	Reference Curve No.	Maximum Density	Optimum Moisture	Degree of Compaction
8.8 %	107.4 lb/ft³	98.7 lb/ft³	1	105.6 lb/ft³	13.0 %	93.5 %

Remarks: RETEST NOT ASKED FOR BY EBASCO Q.C.

Technician: Hazel Calculated By: Hazel Checked By: [illegible]

Emp. No.: 3182 Emp. No.: 3182 Emp. No.: 3445

JR meeks

Peabody Testing

In-Place Density Test-Rubber Balloon

Test Standard ASTM D2167 PB08-09

REVIEWED W3-6497

Project: Waterford SES Unit 3 Lab No. ~~B0021A~~ (LRWE 724) Jam 9-22-76

Client : Ebasco Services Inc Test No. 4

Test Location F4 - 62N, 43W Fill No. 5A

Test Depth ~~-40.50~~ 6-25-76 Date 1/26/76

G.S. Elevation — Time of Test —

Test Elevation -40.50 Volumeter I.D. LRW 61

Sample I.D. Mss. Ruger Scale I.D. LRW 53

Dump Sand Speedy I.D. LRW 62

1. Wt. of Can & Damp Soil, 0.01 lb. 3.17
2. Tare Wt. of Can, 0.01 lb. .107
3. Net Wt. of Damp Soil, 0.01 lb. 3.10

Speedy Moisture, 12.4 %

4. Volume of Test Hole: .10278 ft^3

5. Tare No. —
6. Wt. Tare & Wet Soil, gm. —
7. Wt. Tare & Dry Soil, gm. —
8. Wt. Water, gm. —
9. Wt. Tare, gm. —
10. Wt. of Dry Soil, gm. —
11. Moisture Content (8/10) — %

Retest Required: ___ Yes ✓ No

Retest of Lab No. —

& Date —

Specification Requirement of Compaction 95.0 %

☐ Meets ☑ Does Not Meet Spec.

Moisture Content	Wet Density	Dry Density	Reference Curve No.	Maximum Density	Optimum Moisture	Degree of Compaction
12.4 %	111.5 lb/ft^3	99.2 lb/ft^3	1	105.6 lb/ft^3	13.0 %	93.9 %

Remarks: NO RETEST WAS ASKED FOR BY EBASCO Q.C.

Technician: Hazel Calculated By: Hazel Checked By: [illegible]

Emp. No.: 3182 Emp. No.: 3182 Emp. No.: 3445

JR McE

Peabody Testing

In-Place Density Test-Rubber Balloon

Test Standard ASTM D2167 PB08-09

REVIEWED W3-6497 6-25-76

Project: Waterford SES Unit 3 Lab No. ~~B00073A~~ JRM 9-22-76 (LRWE 701)

Client: Ebasco Services Inc. Test No. 3

Test Location F4-44W, 21S Fill No. 5B

Test Depth — ~~40.30~~ -40.30 6-25-76 Date 1/21/76

G.S. Elevation — Time of Test —

Test Elevation -40.30 Volumeter I.D. LRW-61

Sample I.D. Miss River Pump Sand Scale I.D. LRW-53

Speedy I.D. LRW-62

1. Wt. of Can & Damp Soil, 0.01 lb. 4.06
2. Tare Wt. of Can, 0.01 lb. .07
3. Net Wt. of Damp Soil, 0.01 lb. 3.99

Speedy Moisture, 8.7 %

4. Volume of Test Hole: .0355 ft^3

5. Tare No. —
6. Wt. Tare & Wet Soil, gm. —
7. Wt. Tare & Dry Soil, gm. —
8. Wt. Water, gm. —
9. Wt. Tare, gm. —
10. Wt. of Dry Soil, gm. —
11. Moisture Content (8/10) — %

Retest Required: ☐ Yes ☑ No

Retest of Lab No. —

& Date —

Specification Requirement of Compaction 95.0 %

☑ Meets ☐ Does Not Meet Spec.

Moisture Content	Wet Density	Dry Density	Reference Curve No.	Maximum Density	Optimum Moisture	Degree of Compaction
8.7 %	112.4 lb/ft^3	103.4 lb/ft^3	1	105.6 lb/ft^3	13.0 %	97.9 %

Remarks:

Technician: Hazel Calculated By: Hazel Checked By: [illegible]

Emp. No.: 3182 Emp. No.: 3182 Emp. No.: 3445

JR Wachter

Peabody Testing

In-Place Density Test-Rubber Balloon

Test Standard ASTM D2167 PB08-09

REVIEWED W3-6497 7/8/76

Project: Waterford SES Unit 3 Lab No. JAN 9-22-76 B00024 (LRWE 700)

Client : Ebasco Services Inc. Test No. 2

Test Location F4-80W, 28S Fill No. 5B

Test Depth ~~-39.60~~ 6 2 5-16 Date 1/21/76

G.S. Elevation — Time of Test —

Test Elevation -39.60 Volumeter I.D. LRW-61

Sample I.D. Miss River. Scale I.D. LRW 53

Pump Sand Speedy I.D. LRW 62

1. Wt. of Can & Damp Soil, 0.01 lb. 3.96
2. Tare Wt. of Can, 0.01 lb. .07
3. Net Wt. of Damp Soil, 0.01 lb. 3.89

Speedy Moisture, 10.6 %

4. Volume of Test Hole: .0342 ft^3

5. Tare No. —
6. Wt. Tare & Wet Soil, gm. —
7. Wt. Tare & Dry Soil, gm. —
8. Wt. Water, gm. —
9. Wt. Tare, gm. —
10. Wt. of Dry Soil, gm. —
11. Moisture Content (8/10) — %

Retest Required: ____ Yes ✓ No

Retest of Lab No. —

& Date —

Specification Requirement of Compaction 95.0%

☑ Meets ☐ Does Not Meet Spec.

Moisture Content	Wet Density	Dry Density	Reference Curve No.	Maximum Density	Optimum Moisture	Degree of Compaction
10.6 %	113.7 lb/ft³	~~103.4~~ 102.8 lb/ft³ GH 7/2/76	1	105.6 lb/ft³	13.0 %	97.3 %

Remarks: .

Technician: HHayl Calculated By: HHayl Checked By: [illegible]

Emp. No.: 3182 Emp. No.: 3182 Emp. No.: 3445

JR Nichols

Peabody Testing

In-Place Density Test-Rubber Balloon

Test Standard ASTM D2167 PB08-09

Project: Waterford SES Unit 3 REVIEWED W3-6497 9-25 EB

Lab No. ~~300556A~~ JAM 9-22-76 (LRWE 808)

Client : Ebasco Services Inc.

Test No. 3

Test Location F4-80W, 20N

Fill No. 5A

Test Depth ~~-39.25~~ MBrock 6-25-76 (111)

Date 2/24/76

G.S. Elevation —

Time of Test —

Test Elevation -39.25

Volumeter I.D. LRW61

Sample I.D. Miss River Pump Sand

Scale I.D. LRW53

Speedy I.D. LRW62

1. Wt. of Can & Damp Soil, 0.01 lb. 4.10
2. Tare Wt. of Can, 0.01 lb. .07
3. Net Wt. of Damp Soil, 0.01 lb. 4.03

Speedy Moisture, 10.1 %

4. Volume of Test Hole: .0362 ft^3

5. Tare No. —
6. Wt. Tare & Wet Soil, gm. —
7. Wt. Tare & Dry Soil, gm. —
8. Wt. Water, gm. —
9. Wt. Tare, gm. —
10. Wt. of Dry Soil, gm. —
11. Moisture Content (8/10) — %

Retest Required: ____ Yes ✓ No

Retest of Lab No. —

& Date —

Specification Requirement of Compaction 95.0 %

☑ Meets ☐ Does Not Meet Spec.

Moisture Content	Wet Density	Dry Density	Reference Curve No.	Maximum Density	Optimum Moisture	Degree of Compaction
10.1 %	111.3 lb/ft³	101.1 lb/ft³	6	102.9 lb/ft³	12.5 %	98.3 %

Remarks:

Technician: Hazel Calculated By: Hazle Checked By: G. Heath

Emp. No.: 3182 Emp. No.: 3182 Emp. No.: 3445

Remove

Peabody Testing

In-Place Density Test-Rubber Balloon

Test Standard ASTM D2167 PB08-09

REVIEWED W3-6497 4-24-86

Project: Waterford SES Unit 3 Lab No. ~~B00055-A~~ (LRWE 807) Jam 9-22-76

Client : Ebasco Services Inc. Test No. 2

Test Location FA-18N, 20W Fill No. 5A

Test Depth ~~-39.25~~ Sm Sandcut 4-25-76 Date 2/24/76

G.S. Elevation — Time of Test —

Test Elevation -39.25 Volumeter I.D. 2RW61

Sample I.D. Miss River Scale I.D. 2RW53

Pump Sand Speedy I.D. 2RW62

1. Wt. of Can & Damp Soil, 0.01 lb. 3.49
2. Tare Wt. of Can, 0.01 lb. .07
3. Net Wt. of Damp Soil, 0.01 lb. 3.42

4. Volume of Test Hole: .0305 ft^3

Speedy Moisture, 6.6 %

5. Tare No. —
6. Wt. Tare & Wet Soil, gm. —
7. Wt. Tare & Dry Soil, gm. —
8. Wt. Water, gm. —
9. Wt. Tare, gm. —
10. Wt. of Dry Soil, gm. —
11. Moisture Content (8/10) — %

Retest Required: ____ Yes ✓ No

Retest of Lab No. —

& Date —

Specification Requirement of Compaction 95.0 %

☑ Meets ☐ Does Not Meet Spec.

Moisture Content	Wet Density	Dry Density	Reference Curve No.	Maximum Density	Optimum Moisture	Degree of Compaction
6.6 %	112.1 lb/ft^3	105.2 lb/ft^3	6	102.9 lb/ft^3	12.5 %	102.2 %

Remarks:

Technician: THazel Calculated By: THazel Checked By: GHazel

Emp. No.: 3182 Emp. No.: 3182 Emp. No.: 3445

OR IMG

Peabody Testing

In-Place Density Test-Rubber Balloon

Test Standard ASTM D2167 PB08-09

REVIEWED 8-25-87 W3-6497

Project: Waterford SES Unit 3 Lab No. JRM 4-22-76 B0023A (LRWE 726)

Client : Ebasco Services Inc. Test No. 1

Test Location F4-40W, 53N Fill No. 5A

Test Depth — -39.20 ft Backfill 6-25-76 TH Date 1/27/76

G.S. Elevation — Time of Test —

Test Elevation -39.20 Volumeter I.D. LRW 61

Sample I.D. Miss. River Pump Sand Scale I.D. LRW 53

Speedy I.D. LRW 52

1. Wt. of Can & Damp Soil, 0.01 lb. 3.53
2. Tare Wt. of Can, 0.01 lb. .107
3. Net Wt. of Damp Soil, 0.01 lb. 3.46

4. Volume of Test Hole: .0304 ft³

Speedy Moisture, 9.3 %

5. Tare No. —
6. Wt. Tare & Wet Soil, gm. —
7. Wt. Tare & Dry Soil, gm. —
8. Wt. Water, gm. —
9. Wt. Tare, gm. —
10. Wt. of Dry Soil, gm. —
11. Moisture Content (8/10) — %

Retest Required: ☐ Yes ✓ No

Retest of Lab No. —

& Date —

Specification Requirement of Compaction 95.0 %

☑ Meets ☐ Does Not Meet Spec.

Moisture Content	Wet Density	Dry Density	Reference Curve No.	Maximum Density	Optimum Moisture	Degree of Compaction
9.3 %	113.8 lb/ft³	104.1 lb/ft³	1	105.6 lb/ft³	13.0 %	98.6 %

Remarks:

Technician: Hayek Calculated By: Hayek Checked By: Hayek

Emp. No.: 3182 Emp. No.: 3182 Emp. No.: 3445

CR Mc

Peabody Testing

In-Place Density Test-Rubber Balloon

Test Standard ASTM D2167 PB08-09

REVIEWED W3-649703 6-25-76

Project: Waterford SES Unit 3 Lab No. ~~B0022A~~ (LRWE 725) JAM 9-22-76

Client: Ebasco Services Inc. Test No. 5

Test Location F3-7N,43W Fill No. 5A

Test Depth —-39.20 Marker ft 6-25-76 Date 1/26/76

G.S. Elevation — Time of Test —

Test Elevation -39.20 Volumeter I.D. LRW 61

Sample I.D. Miss. River Pump Sand Scale I.D. ~~LRW 5~~ 53 T. Hazel 6/23/76

Speedy I.D. LRW 62

1. Wt. of Can & Damp Soil, 0.01 lb. 3.54
2. Tare Wt. of Can, 0.01 lb. 107
3. Net Wt. of Damp Soil, 0.01 lb. 3.47

Speedy Moisture, 13.8 %

4. Volume of Test Hole: 10307 ft^3

5. Tare No. —
6. Wt. Tare & Wet Soil, gm. —
7. Wt. Tare & Dry Soil, gm. —
8. Wt. Water, gm. —
9. Wt. Tare, gm. —
10. Wt. of Dry Soil, gm. —
11. Moisture Content (8/10) — %

Retest Required: ____ Yes ✓ No

Retest of Lab No. — & Date —

Specification Requirement of Compaction 95.0 %

☐ Meets ☑ Does Not Meet Spec.

Moisture Content	Wet Density	Dry Density	Reference Curve No.	Maximum Density	Optimum Moisture	Degree of Compaction
13.8 %	113.0 lb/ft³	99.3 lb/ft³	1	105.6 lb/ft³	13.0 %	94.0 %

Remarks: NO RETEST ASKED for By Ebasco Q.C.

Technician: T Hazel Calculated By: T Hazel Checked By: G Horvath

Emp. No.: 3182 Emp. No.: 3182 Emp. No.: 3445

Peabody Testing

In-Place Density Test-Rubber Balloon

Test Standard ASTM D2167 PB08-09

REVIEWED W3-6497

Project: Waterford SES Unit 3 Lab No. ~~B0169A~~ JRM 9-22-76 LRW 1031

Client: Ebasco Services Inc. Test No. 2

Test Location 3E 33E 30N Fill No. 5A

Test Depth 0.0 Date 8/12/76

G.S. Elevation -39.00 Time of Test 0855

Test Elevation -39.00 Volumeter I.D. PT-154

Sample I.D. MISS. RIVER. PUMP SAND/SHELL Scale I.D. PT-072

Speedy I.D. PT-191

1. Wt. of Can & Damp Soil, 0.01 lb. 4.12
2. Tare Wt. of Can, 0.01 lb. 0.07
3. Net Wt. of Damp Soil, 0.01 lb. 4.05

Speedy Moisture, 9.0/9.9 %

4. Volume of Test Hole: .0326 ft³

5. Tare No. — 8
6. Wt. Tare & Wet Soil, gm. — 368.9
7. Wt. Tare & Dry Soil, gm. — 332.0
8. Wt. Water, gm. — ~~36.6~~ CH 8-12-76 36.9
9. Wt. Tare, gm. 180
10. Wt. of Dry Soil, gm. 314.0
11. Moisture Content (8/10) 11.8 %

Retest Required: ___ Yes ↘ No

Retest of Lab No. —

& Date —

Specification Requirement of Compaction 95 %

[X] Meets [ ] Does Not Meet Spec.

Moisture Content	Wet Density	Dry Density	Reference Curve No.	FIELD Maximum Density	FIELD Optimum Moisture	FIELD Degree of Compaction
9.9 %	124.2 lb/ft³	113.0 lb/ft³	15/18	105.0 / 103.9 lb/ft³ LAB	11.2 / 15.1 % LAB	107.6 / 108.8 % LAB

Remarks: N/A

Technician: P. Mikinka Calculated By: S. Horwitch Checked By: HAZEL

Emp. No.: 5252 Emp. No.: 3445 Emp. No.: 3182

JRM

Peabody Testing

In-Place Density Test-Rubber Balloon

Test Standard ASTM D2167 PB08-09

REVIEWED W3-6497 5-7-87 TLS

Project: Waterford 3ES Unit 3 Lab No. ~~B0004A~~ JRM 9-22-76 (LRWE 702)

Client : Ebasco Services Inc. Test No. 4

Test Location F4 - 40W, 16N Fill No. 5B

Test Depth ~~-39.00~~ Number of 6-25-76 Date 1/21/76

G.S. Elevation — Time of Test —

Test Elevation -39.00 Volumeter I.D. LRW-61 Thayer

Sample I.D. MISS RIVER PUMP SAND Scale I.D. LRW-~~53~~ 53

Speedy I.D. LRW 62

1. Wt. of Can & Damp Soil, 0.01 lb. 3.77
2. Tare Wt. of Can, 0.01 lb. .07
3. Net Wt. of Damp Soil, 0.01 lb. 3.70

Speedy Moisture, 9.9 %

4. Volume of Test Hole: .0319 ft^3

5. Tare No. —
6. Wt. Tare & Wet Soil, gm. —
7. Wt. Tare & Dry Soil, gm. —
8. Wt. Water, gm. —
9. Wt. Tare, gm. —
10. Wt. of Dry Soil, gm. —
11. Moisture Content (8/10) — %

Retest Required: ____ Yes ✓ No

Retest of Lab No. —

& Date —

Specification Requirement of Compaction 95.0 %

☑ Meets ☐ Does Not Meet Spec.

Moisture Content	Wet Density	Dry Density	Reference Curve No.	Maximum Density	Optimum Moisture	Degree of Compaction
9.9 %	116.0 lb/ft^3	105.6 lb/ft^3	1	105.6 lb/ft^3	13.0%	100.0 %

Remarks:

Technician: Thayer Calculated By: Thayer Checked By: Thayer

Emp. No.: 3182 Emp. No.: 3182 Emp. No.: 3445

JRM

Peabody Testing

In-Place Density Test--Rubber Balloon

Test Standard ASTM D2167 PB08-09

REVIEWED 8-23-83 W3-6497

JAM 8-22-76

Project: Waterford SES Unit 3 Lab No. ~~B0173A~~ LRU 1036

Client: Ebasco Services Inc. Test No. 6

Test Location E4 33E 10N Fill No. 5B

Test Depth 0.0 Date 8/12/76

G.S. Elevation -38.75 Time of Test 1321

Test Elevation -38.75 Volumeter I.D. PT-153

Sample I.D. MISS RIVER. Scale I.D. PT-072

PUMP SAND/SHELL Speedy I.D. PT-191

Oven I.D. PT-122

1. Wt. of Can & Damp Soil, 0.01 lb. 3.79
2. Tare Wt. of Can, 0.01 lb. 0.07
3. Net Wt. of Damp Soil, 0.01 lb. 3.72

4. Volume of Test Hole: .0319 ft^3

Speedy Moisture, 10.4/11.6 %

5. Tare No. 13
6. Wt. Tare & Wet Soil, gm. 446.7
7. Wt. Tare & Dry Soil, gm. 392.3
8. Wt. Water, gm. 54.4
9. Wt. Tare, gm. 17.5
10. Wt. of Dry Soil, gm. 374.8
11. Moisture Content (8/10) 14.5 %

Retest Required: ____ Yes ✓ No

Retest of Lab No. -

& Date -

Specification Requirement of Compaction 95 %

☑ Meets ☐ Does Not Meet Spec.

Moisture Content	Wet Density	Dry Density	Reference Curve No.	FIELD Maximum Density	FIELD Optimum Moisture	FIELD Degree of Compaction
11.6 %	116.6 lb/ft^3	104.5 lb/ft^3	15/18	105.0 / 103.9 lb/ft^3 LAB	11.2 / 15.1 % LAB	99.5 / 100.6 % LAB

Remarks: N/A

Technician: P. Mikinka Calculated By: G. Horwith Checked By: J. Hazel

Emp. No.: 5252 Emp. No.: 3445 Emp. No.: 3182

JRM

Peabody Testing

In-Place Density Test-Rubber Balloon

Test Standard ASTM D2167 PB08-09

REVIEWED W3-6497 8-25-76 TED

Project: Waterford SES Unit 3 Lab No. B0005A (LRWE 703) JRH 9-22-76

Client : Ebasco Services Inc. Test No. 5

Test Location F4-70W, 17N Fill No. 5B

Test Depth — ~~38.30~~ 6-25-76 Date 1/21/76

G.S. Elevation — Time of Test —

Test Elevation -38.30 Volumeter I.D. LRW 61

Sample I.D. MISS RIVER PUMP SAND Scale I.D. LRW 53

Speedy I.D. LRW 62

1. Wt. of Can & Damp Soil, 0.01 lb. 3.62
2. Tare Wt. of Can, 0.01 lb. .07
3. Net Wt. of Damp Soil, 0.01 lb. 3.55

Speedy Moisture, 8.0 %

4. Volume of Test Hole: .0314 ft^3

5. Tare No. —
6. Wt. Tare & Wet Soil, gm. —
7. Wt. Tare & Dry Soil, gm. —
8. Wt. Water, gm. —
9. Wt. Tare, gm. —
10. Wt. of Dry Soil, gm. —
11. Moisture Content (8/10) — %

Retest Required: ____ Yes ✓ No

Retest of Lab No. —

& Date —

Specification Requirement of Compaction 95.0 %

☑ Meets ☐ Does Not Meet Spec.

Moisture Content	Wet Density	Dry Density	Reference Curve No.	Maximum Density	Optimum Moisture	Degree of Compaction
8.0 %	113.1 lb/ft^3	104.7 lb/ft^3	1	105.6 lb/ft^3	13.0 %	99.1 %

Remarks:

Technician: T Hazel Calculated By: T Hazel Checked By: [illegible]

Emp. No.: 3182 Emp. No.: 3182 Emp. No.: 3445

JR

Peabody Testing

In-Place Density Test-Rubber Balloon

Test Standard ASTM D2167 PB08-09

REVIEWED W3-6497 FAL 2-28-76

Project: Waterford SES Unit 1 Lab No. ~~B005EA~~ (LRWE 811) JRM 9-22-76

Client : Ebasco Services Inc. Test No. 2

Test Location F4-50W,30N Fill No. 5A

Test Depth — ~~-38.25~~ -38.25 6-25-76 Date 2/25/76

G.S. Elevation — Time of Test —

Test Elevation -38.25 Volumeter I.D. 1RW61

Sample I.D. Miss River Pump Sand Scale I.D. 1RW53

Speedy I.D. 1RW62

1. Wt. of Can & Damp Soil, 0.01 lb. 3.33
2. Tare Wt. of Can, 0.01 lb. .07
3. Net Wt. of Damp Soil, 0.01 lb. 3.26

Speedy Moisture, 16.3 %

4. Volume of Test Hole: .0260 ft³

5. Tare No. —
6. Wt. Tare & Wet Soil, gm. —
7. Wt. Tare & Dry Soil, gm. —
8. Wt. Water, gm. —
9. Wt. Tare, gm. —
10. Wt. of Dry Soil, gm. —
11. Moisture Content (8/10) — %

Retest Required: ____ Yes ✓ No

Retest of Lab No. — & Date —

Specification Requirement of Compaction 95.0 %

☑ Meets ☐ Does Not Meet Spec.

Moisture Content	Wet Density	Dry Density	Reference Curve No.	Maximum Density	Optimum Moisture	Degree of Compaction
16.3 %	125.4 lb/ft³	107.8 lb/ft³	3	104.7 lb/ft³	14.0 %	103.0 %

Remarks:

Technician: Hazel Calculated By: Hazel Checked By: G. Harwell

Emp. No.: 3182 Emp. No.: 3182 Emp. No.: 3445

JRM

Peabody Testing

In-Place Density Test-Rubber Balloon

Test Standard ASTM D2167 PB08-09

REVIEWED W3-6497 4-13-83 TEB

Project: Waterford SES Unit 3 Lab No. ~~B0059A~~ JAM 9.22-76 (LRWE 812)

Client : Ebasco Services Inc. Test No. 3

Test Location F4-43W, 35N Fill No. 5A

Test Depth ~~-38.25~~ Amended 6-25-76 Date 2/25/76

G.S. Elevation — Time of Test —

Test Elevation -38.25 Volumeter I.D. LRW61

Sample I.D. Miss River Scale I.D. LRW53

Pump Sand Speedy I.D. LRW62

1. Wt. of Can & Damp Soil, 0.01 lb. 3.94
2. Tare Wt. of Can, 0.01 lb. .07
3. Net Wt. of Damp Soil, 0.01 lb. 3.87

Speedy Moisture, 10.0 %

4. Volume of Test Hole: .0340 ft³

5. Tare No. —
6. Wt. Tare & Wet Soil, gm. —
7. Wt. Tare & Dry Soil, gm. —
8. Wt. Water, gm. —
9. Wt. Tare, gm. —
10. Wt. of Dry Soil, gm. —
11. Moisture Content (8/10) — %

Retest Required: ____ Yes ✓ No

Retest of Lab No. — & Date —

Specification Requirement of Compaction 95.0 %

☑ Meets ☐ Does Not Meet Spec.

Moisture Content	Wet Density	Dry Density	Reference Curve No.	Maximum Density	Optimum Moisture	Degree of Compaction
10.0 %	113.8 lb/ft³	103.5 lb/ft³	3	104.7 lb/ft³	14.0 %	~~98.8~~ 98.9 %

Ck. 12/76

Remarks:

Technician: Hazel Calculated By: Hazel Checked By: G. Thornhill

Emp. No.: 3182 Emp. No.: 3182 Emp. No.: 3445

J.R. Meade

Peabody Testing

In-Place Density Test-Rubber Balloon

Test Standard ASTM D2167 PB08-09

JRM 9-22-76

Project: Waterford SES Unit 3 Lab No. ~~B0174A~~ LRW 1037

REVIEWED W3-6497 FEB 23

Client: Ebasco Services Inc. Test No. 7

Test Location E4 3/E 10N Fill No. 5B

Test Depth 0.0 Date 8/12/76

G.S. Elevation -38.25 Time of Test 1416

Test Elevation -38.25 Volumeter I.D. PT-~~153~~ 153 MI 9-23-76

Sample I.D. MISS RIVER PUMP SAND/SHELL Scale I.D. PT-072

Speedy I.D. PT-191

1. Wt. of Can & Damp Soil, 0.01 lb. 3.67
2. Tare Wt. of Can, 0.01 lb. 0.07
3. Net Wt. of Damp Soil, 0.01 lb. 3.60
4. Volume of Test Hole: .0282 ft³
5. Tare No. —
6. Wt. Tare & Wet Soil, gm. —
7. Wt. Tare & Dry Soil, gm. —
8. Wt. Water, gm. —
9. Wt. Tare, gm. —
10. Wt. of Dry Soil, gm. —
11. Moisture Content (8/10) — %

Speedy Moisture, 14.0/16.3 %

Retest Required: ___ Yes ✓ No

Retest of Lab No. —

& Date —

Specification Requirement of Compaction 95 %

☒ Meets ☐ Does Not Meet Spec.

Moisture Content	Wet Density	Dry Density	Reference Curve No.	FIELD Maximum Density	FIELD Optimum Moisture	FIELD Degree of Compaction
16.3 %	127.7 lb/ft³	109.8 lb/ft³	15 / 18	105.0 / 103.9 lb/ft³ WB	11.2 / 15.1 % LAB	104.6 / 105.7 % LAB

Remarks: N/A

Technician: P. Mikinka Calculated By: G. Howell Checked By: Hazel

Emp. No.: 5252 Emp. No.: 3445 Emp. No.: 3182

Peabody Testing

In-Place Density Test--Rubber Balloon

Test Standard ASTM D2167 PB08-09

REVIEWED W3-6497

Project: Waterford SES Unit 3 Lab No. ~~B0170A~~ Jan 9-22-76 LRW 1033

Client: Ebasco Services Inc. Test No. 3 ~~LRW 1032~~ PSM

Test Location 3E 32E 31N Fill No. 5A

Test Depth 0.0 Date 8/12/76

G.S. Elevation -38.00 Time of Test 1001

Test Elevation -38.00 Volumeter I.D. PT-154

Sample I.D. MISS RIVER PUMP SAND SHELL Scale I.D. PT-072

Speedy I.D. PT-191

1. Wt. of Can & Damp Soil, 0.01 lb. 3.54
2. Tare Wt. of Can, 0.01 lb. 0.07
3. Net Wt. of Damp Soil, 0.01 lb. 3.47

Speedy Moisture, 11.0/12.4 %

4. Volume of Test Hole: .0276 ft³

5. Tare No. —
6. Wt. Tare & Wet Soil, gm. —
7. Wt. Tare & Dry Soil, gm. —
8. Wt. Water, gm. —
9. Wt. Tare, gm. —
10. Wt. of Dry Soil, gm. —
11. Moisture Content (8/10) — %

Retest Required: ___ Yes ✓ No

Retest of Lab No. —

& Date —

Specification Requirement of Compaction 95 %

☒ Meets ☐ Does Not Meet Spec.

Moisture Content	Wet Density	Dry Density	Reference Curve No.	FIELD Maximum Density	FIELD Optimum Moisture	FIELD Degree of Compaction
12.4 %	125.7 lb/ft³	111.8 lb/ft³	15/18	105.0 / 103.1 lb/ft³ LAB	11.2 / 15.1 % LAB	106.5 / 107.6 % LAB

Remarks: COMPACTION

Technician: L. McKinka Calculated By: GHeaton Checked By: JRW

Emp. No.: 5252 Emp. No.: 3445 Emp. No.: 512

Peabody Testing

In-Place Density Test--Rubber Balloon

Test Standard ASTM D2167 PB08--09

REVIEWED W3-6497

Project: Waterford SES Unit 3 Lab No. ~~B0172A~~ LAW1035 JRM 9-22-76

Client: Ebasco Services Inc. Test No. 5

Test Location 3E 34E 3L N-GH 8/12/76 Fill No. 5A

Test Depth 0.0 Date 8/12/76

G.S. Elevation -37.75 Time of Test 1132

Test Elevation -3775 Volumeter I.D. PT-153

Sample I.D. MISS RIVER PUMP SAND/SHELL Scale I.D. PT-072

Speedy I.D. PT-~~077~~ 191 MI 9-23-76

1. Wt. of Can & Damp Soil, 0.01 lb. 3.64
2. Tare Wt. of Can, 0.01 lb. 0.07
3. Net Wt. of Damp Soil, 0.01 lb. 3.57

Speedy Moisture, 9.0/9.9 %

4. Volume of Test Hole: .0300 ft³

5. Tare No. —
6. Wt. Tare & Wet Soil, gm. —
7. Wt. Tare & Dry Soil, gm. —
8. Wt. Water, gm. —
9. Wt. Tare, gm. —
10. Wt. of Dry Soil, gm. —
11. Moisture Content (8/10) — %

Retest Required: ___ Yes ↘ No

Retest of Lab No. —

& Date —

Specification Requirement of Compaction 95 %

☒ Meets ☐ Does Not Meet Spec.

Moisture Content	Wet Density	Dry Density	Reference Curve No.	Field Maximum Density	Field Optimum Moisture	Field Degree of Compaction
9.9 ~~9.9~~ % GW 8-13-76	119.0 lb/ft³	108.3 lb/ft³	15/14	105.0 / 103.7 lb/ft³ LAB	11.2 / 15.1 % LAB	103.1 / 104.2 % LAB

Remarks: N/A

Technician: P. Mikinka Calculated By: G. Howard Checked By: T. Hazel

Emp. No.: 5252 Emp. No.: 3445 Emp. No.: 3182

JRM 9-22-76

Peabody Testing

In-Place Density Test-Rubber Balloon

Test Standard ASTM D2167 PB08-09

REVIEWED W3-6497 5-25-83

Project: Waterford SES Unit 3 Lab No. ~~B0006 A~~ (LRWE 704) Jan 9-22-76 MI 9-23-76

Client : Ebasco Services Inc Test No. 6

Test Location F4-43W, 10S Fill No. 5B

Test Depth ~~-37.70~~ 11 Bucket 6-RS-SF Date 1/21/76

G.S. Elevation — Time of Test —

Test Elevation -37.70 Volumeter I.D. LRW 61

Sample I.D. MISS RIVER Scale I.D. LRW 53

PUMP SAND Speedy I.D. LRW 62

1. Wt. of Can & Damp Soil, 0.01 lb. 4.22
2. Tare Wt. of Can, 0.01 lb. .07
3. Net Wt. of Damp Soil, 0.01 lb. 4.15

Speedy Moisture, 10.9 %

4. Volume of Test Hole: .0381 ft^3

5. Tare No. —
6. Wt. Tare & Wet Soil, gm. —
7. Wt. Tare & Dry Soil, gm. —
8. Wt. Water, gm. —
9. Wt. Tare, gm. —
10. Wt. of Dry Soil, gm. —
11. Moisture Content (8/10) — %

Retest Required: ____ Yes ✓ No

Retest of Lab No. —

& Date —

Specification Requirement of Compaction 95.0 %

☐ Meets ☑ Does Not Meet Spec.

Moisture Content	Wet Density	Dry Density	Reference Curve No.	Maximum Density	Optimum Moisture	Degree of Compaction
10.9 %	108.9 lb/ft³	98.2 lb/ft³	1	~~93.3~~ 105.6 lb/ft³	1/21/76 13.0 %	~~93.3~~ % 93.0

Remarks: RETEST NOT ASKED FOR BY EBASCO Q.C. 7/2/76

Technician: T Hazel Calculated By: T Hazel Checked By: [illegible]

Emp. No.: 3182 Emp. No.: 3182 Emp. No.: 3445

JR Inc

Peabody Testing

In-Place Density Test-Rubber Balloon

Test Standard ASTM D2167 PB08-09

REVIEWED W3-6497 4-28-76

Project: Waterford SES Unit 3 Lab No: ~~B0175A~~ Jan 8-22-76 LRW 1038

Client: Ebasco Services Inc. Test No. 8

Test Location E4 32E 11N Fill No. 5B

Test Depth 0.0 Date 8/12/76

G.S. Elevation -3750 Time of Test 1456

Test Elevation -3750 Volumeter I.D. PT-153

Sample I.D. MISS RIVER PUMP SAND/SHELL Scale I.D. PT-072

Speedy I.D. PT-191

1. Wt. of Can & Damp Soil, 0.01 lb. 3.49
2. Tare Wt. of Can, 0.01 lb. 0.07
3. Net Wt. of Damp Soil, 0.01 lb. 3.42

Speedy Moisture, 9.6/10.6 %

4. Volume of Test Hole: .0283 ft³

5. Tare No. —
6. Wt. Tare & Wet Soil, gm. —
7. Wt. Tare & Dry Soil, gm. —
8. Wt. Water, gm. —
9. Wt. Tare, gm. —
10. Wt. of Dry Soil, gm. —
11. Moisture Content (8/10) — %

Retest Required: ___ Yes ✓ No

Retest of Lab No. — & Date —

Specification Requirement of Compaction 95 %

☑ Meets ☐ Does Not Meet Spec.

Moisture Content	Wet Density	Dry Density	Reference Curve No.	FIELD Maximum Density	FIELD Optimum Moisture	FIELD Degree of Compaction
10.6 %	120.8 lb/ft³	109.2 lb/ft³	15/16	~~105.6~~ 103.4 lb/ft³ LAB	11.2/15.1 % LAB	104.0/105.1 % LAB

Remarks: N/A

Technician: P Mikinka Calculated By: G. Horvitch Checked By: HAZEL

Emp. No.: 5252 Emp. No.: 3445 Emp. No.: 3182

JR

Roadbody Testing

In-Place Density Test-Rubber Balloon

Test Standard ASTM D2167

REVIEWED W3-6497 5-25-83

Project: Waterford SES Unit 3 — Lab No. B0102A
Client: Ebasco Services, Inc — Test No. 3
Test Location E4 69N 27E — Fill No. 5
Test Depth 0.5 — Date 10/13/76
G.S. Elevation -37.00 — Time of Test 0845
Test Elevation -37.50 — Volumeter I.D. PT-154
Sample I.D. MISS RIVER PUMP SAND — Scale I.D. PT-076 Oven I.D. —
Speedy I.D. PT-193

1.	Wt of Can & Damp Soil, 0.01 lb.	3.87	4. Volume of Test Hole:
2.	Tare Wt. of Can, 0.01 lb.	0.07	
3.	Net Wt. of Damp Soil, 0.01 lb.	3.80	.0322 ft³

Speedy Moisture, 14.0 / 16.3 % (4)

OVEN DRY

5.	Tare No.	—
6.	Wt. Tare & Wet Soil, gm.	—
7.	Wt. Tare & Dry Soil, gm.	—
8.	Wt. Water, gm.	—
9.	Wt. Tare, gm.	—
10.	Wt. of Dry Soil, gm.	—
11.	Moisture Content (8/10)	—

SPEC. LIMITS ± 3% ABOVE OPTIMUM

EBASCO FIELD ACCEPTANCE

Retest Required: Yes ✓ No

Retest of Lab No. -

and Date -

Specification Requirement of Compaction 99 %

☒ Meets ☐ Does Not Meet Spec.

EBASCO QC Ben M. Baker

DATE 10/13/76

Moisture Content	Wet Density	Dry Density	Reference Curve No.	Maximum Density	Optimum Moisture	Degree of Compaction
16.3 %	118.0	(3) 101.5	34	(1) 102.1 / (2) 102.1	(1) 14.1 / (2) 14.1 %	(1) 99.4 / (2) 99.4 %
	lb/ft³	lb/ft³		lb/ft³		

Remarks: EAST WALL WATERPROOFING DITCH

Tested By GHA Emp. No. 3445 — Calculated By GHA Emp. No. 3445 — Checked By [illegible] Emp. No. 3182 — Reviewed By [illegible] Emp. No. [illegible]

(1) Determined in field MAD 10-14-76
(2) Determined after lab verification
(3) Use oven dry for calculations, when available
(4) % wet wt/% dry wt

Q. A. REVIEW
BY M Angel
DATE 10-18-76

Form No. RBDB-09-6752

Peabody Testing

In-Place Density Test-Rubber Balloon

Test Standard ASTM D2167 PB08-09

REVIEWED W3-6497 4-25-97

Project: Waterford SES Unit 3 Lab No. JRM 9.22.96 B00160A (LRWE 813)

Client : Ebasco Services Inc. Test No. 1

Test Location F3-80S,70W Fill No. 5A

Test Depth — -37.25 per Arnold 6-05-96 Date 2/26/96

G.S. Elevation — Time of Test —

Test Elevation -37.25 Volumeter I.D. LRW61

Sample I.D. Miss River Pump Sand Scale I.D. LRW53

Speedy I.D. LRW62

1. Wt. of Can & Damp Soil, 0.01 lb. 3.29
2. Tare Wt. of Can, 0.01 lb. .07
3. Net Wt. of Damp Soil, 0.01 lb. 3.22

Speedy Moisture, 14.2 %

4. Volume of Test Hole: .0277 ft³

5. Tare No. —
6. Wt. Tare & Wet Soil, gm. —
7. Wt. Tare & Dry Soil, gm. —
8. Wt. Water, gm. —
9. Wt. Tare, gm. —
10. Wt. of Dry Soil, gm. —
11. Moisture Content (8/10) — %

Retest Required: ____ Yes ✓ No

Retest of Lab No. — & Date —

Specification Requirement of Compaction 95.0 %

☑ Meets ☐ Does Not Meet Spec.

Moisture Content	Wet Density	Dry Density	Reference Curve No.	Maximum Density	Optimum Moisture	Degree of Compaction
14.2 %	116.2 lb/ft³	101.8 lb/ft³	6	102.9 lb/ft³	12.5 %	98.9 %

Remarks:

Technician: Hayes Calculated By: Hayes Checked By: G. Howard

Emp. No.: 3182 Emp. No.: 3182 Emp. No.: 3445

JRM

Peabody Testing

In-Place Density Test-Rubber Balloon

Test Standard ASTM D2167

TLB REVIEWED W3-6497 8-25

Project: Waterford SES Unit 3 — Lab No. B0101ARRRRR

Client: Ebasco Services, Inc. — Test No. 4

Test Location E4 60N 27E — Fill No. 5

Test Depth 0.5 — Date 10/14/76

G.S. Elevation -36.50 — Time of Test 1100

Test Elevation -37.00 — Volumeter I.D. PT-154

Sample I.D. MISS RIVER PUMP SAND — Scale I.D. PT-072 — Oven I.D. —

Speedy I.D. PT-193

1.	Wt of Can & Damp Soil, 0.01 lb.	3.59	4. Volume of Test Hole: .0332 ft
2.	Tare Wt. of Can, 0.01 lb.	0.07	
3.	Net Wt. of Damp Soil, 0.01 lb.	3.52	

Speedy Moisture, 12.0 / 13.6 % (4)

OVEN DRY

5.	Tare No.	—
6.	Wt. Tare & Wet Soil, gm.	—
7.	Wt. Tare & Dry Soil, gm.	—
8.	Wt. Water, gm.	—
9.	Wt. Tare, gm.	—
10.	Wt. of Dry Soil, gm.	—
11.	Moisture Content (8/10)	—

SPEC. LIMITS ≤ 3% ABOVE OPTIMUM

EBASCO FIELD ACCEPTANCE

Retest Required: ✓ Yes ____ No

Retest of Lab No B0101ARRR and Date 10/14/76

Specification Requirement of Compaction 97 %

☐ Meets ☒ Does Not Meet Spec

EBASCO QC [signature]

DATE 10/14/76

Moisture Content	Wet Density	Dry Density	Reference Curve No.	Maximum Density	Optimum Moisture	Degree Compact
13.6 %	106.0 lb/ft³	(3) 93.3 lb/ft³	36	(1) 103.1 (2) 103.2 lb/ft³	(1) 17½ +0.5 10/14/76 (2) +0.5% 17½	(1) 90.5 (2) 90

Remarks: EAST WALL WATERPROOFING DITCH

SEE B0101ARRRRRR

Tested By [signature] Emp.No. 3445 — Calculated By [signature] Emp. No. 3445 — Checked By IHAzel Emp. No. 3182 — Reviewed By [signature]

(1) Determined in field
(2) Determined after lab verification
(3) Use oven dry for calculations, when available
(4) % wet wt/% dry wt

Q. A. REVIEW
BY [signature]
DATE 10-18-76

Peabody Testing

In-Place Density Test-Rubber Balloon

Test Standard ASTM D2167

REVIEWED FOR CONFORMANCE WITH CONTRACT DOCUMENTS 83-6497 Sept. 83

Project: Waterford SES Unit 3 — Lab No. B0101ARRRR

Client: Ebasco Services, Inc. — Test No. 10

Test Location E4 60N 27E. — Fill No. 5

Test Depth 0.25 — Date 10/13/76

G.S. Elevation -37.00 — Time of Test 1440

Test Elevation -37.25 — Volumeter I.D. PT-154

Sample I.D. MISS RIVER PUMP SAND — Scale I.D. PT-076 Oven I.D. —

Speedy I.D. PT-193

1.	Wt of Can & Damp Soil, 0.01 lb.	3.80	4. Volume of Test Hole: .0327 ft
2.	Tare Wt. of Can, 0.01 lb.	0.07	
3.	Net Wt. of Damp Soil, 0.01 lb.	3.73	
	Speedy Moisture,	14.7 / 17.2 % (4)	

OVEN DRY

5.	Tare No.	—
6.	Wt. Tare & Wet Soil, gm.	—
7.	Wt. Tare & Dry Soil, gm.	—
8.	Wt. Water, gm.	—
9.	Wt. Tare, gm.	—
10.	Wt. of Dry Soil, gm.	—
11.	Moisture Content (8/10)	—

SPEC. LIMITS ≤ 3% ABOVE OPTIMUM

EBASCO FIELD ACCEPTANCE

Retest Required: ✓ Yes ☐ No

Retest of Lab No. B0101ARRR and Date 10/13/76

Specification Requirement of Compaction 99 %

☐ Meets ☑ Does Not Meet Spec.

EBASCO QC [signature]

DATE 10/13/76

Moisture Content	Wet Density	Dry Density	Reference Curve No.	Maximum Density	Optimum Moisture	Degree Compac
17.2 %	114.1	(3) 97.4	34	(1) 102.1 / (2) 102.1	(1) 14.1 / (2) 14.1 %	(1) 95.4 / (2) 95
	lb/ft³	lb/ft³		lb/ft³		

Remarks: EAST WALL WATERPROOFING DITCH

SEE B0101ARRRRR

Tested By [signature] Emp.No. 3445 — Calculated By [signature] Emp. No. 3445 — Checked By [signature] Emp. No. 3142 — Reviewed By [signature] Emp.No. 31

(1) Determined in field MAO 10-14-76
(2) Determined after lab verification
(3) Use oven dry for calculations, when available
(4) % wet wt/% dry wt

Q. A. REVIEW
BY [signature]
DATE 10-18-76

Raabody Testing

In-Place Density Test-Rubber Balloon

Test Standard ASTM D2167

Project: Waterford SES Unit 3
Client: Ebasco Services, Inc.
Test Location E4 60N 27E
Test Depth 0.25
G.S. Elevation -37.00
Test Elevation -37.25
Sample I.D. MISS RIVER PUMP SAND

REVIEWED W3-6497

Lab No. B0101ARRR
Test No. 6
Fill No. 5
Date 10/13/76
Time of Test 1108
Volumeter I.D. PT-153
Scale I.D. PT-076 Oven I.D. —
Speedy I.D. PT-193

1. Wt of Can & Damp Soil, 0.01 lb. 3.64
2. Tare Wt. of Can, 0.01 lb. 0.07
3. Net Wt. of Damp Soil, 0.01 lb. 3.57
4. Volume of Test Hole: .0316 ft³

Speedy Moisture, 13.8 / 16.0 % (4)

OVEN DRY

5. Tare No. —
6. Wt. Tare & Wet Soil, gm. —
7. Wt. Tare & Dry Soil, gm. —
8. Wt. Water, gm. —
9. Wt. Tare, gm. —
10. Wt. of Dry Soil, gm. —
11. Moisture Content (8/10) —

SPEC. LIMITS ± 3% ABOVE OPTIMUM

EBASCO FIELD ACCEPTANCE

Retest Required: ✓ Yes
No
Retest of Lab No. B0101ARR and Date 10/13/76
Specification Requirement of Compaction 99 %
☐ Meets ☒ Does Not Meet Spec
EBASCO QC [signature]
DATE 10/13/76

Moisture Content	Wet Density	Dry Density	Reference Curve No.	Maximum Density	Optimum Moisture	Degree of Compaction
16.0 %	113.0	97.4 (3)	34	(1) 102.1 / (2) 102.1	(1) 14.1 / (2) 14.1 %	(1) 95.4 / (2) 95.4 %
	lb/ft³	lb/ft³		lb/ft³		

Remarks: EAST WALL WATERPROOFING DITCH

SEE B0101ARRRR

Tested By G Honsted Emp. No. 3445
Calculated By G Honsted Emp. No. 3445
Checked By [illegible] Emp. No. 3182
Reviewed By [illegible] Emp. No. [illegible]

(1) Determined in field MAD 10-14-76
(2) Determined after lab verification
(3) Use oven dry for calculations, when available
(4) % wet wt/% dry wt

Q. A. REVIEW
BY [signature]
DATE 10-18-76

Form No. 9B09-09-6752

Peabody Testing

In-Place Density Test-Rubber Balloon

Test Standard ASTM D2167

REVIEWED W3-6497 8-25-83

Project: Waterford SES Unit 3
Client: Ebasco Services, Inc.
Test Location E4 60N 27E
Test Depth 0.25
G.S. Elevation -37.00
Test Elevation -37.25
Sample I.D. MISS. RIVER PUMP SAND

Lab No. B0101ARR
Test No. 5
Fill No. 5
Date 10/13/76
Time of Test 0950
Volumeter I.D. PT-154
Scale I.D. PT-076 Oven I.D. —
Speedy I.D. PT-193

1. Wt of Can & Damp Soil, 0.01 lb. 3.49
2. Tare Wt. of Can, 0.01 lb. " 0.07
3. Net Wt. of Damp Soil, 0.01 lb. 3.42
   Speedy Moisture, 12.6 / 14.4 % (4)

4. Volume of Test Hole: .0312 ft³

OVEN DRY

5. Tare No. —
6. Wt. Tare & Wet Soil, gm. —
7. Wt. Tare & Dry Soil, gm. —
8. Wt. Water, gm. —
9. Wt. Tare, gm. —
10. Wt. of Dry Soil, gm. —
11. Moisture Content (8/10) —

SPEC. LIMITS ± 3% ABOVE OPTIMUM

EBASCO FIELD ACCEPTANCE

Retest Required: ✓ Yes ____ No
Retest of Lab No. B0101ARR and Date 10/13/76
Specification Requirement of Compaction 99 %
☐ Meets ☒ Does Not Meet Spec.
EBASCO QC [signature]
DATE 10/13/76

Moisture Content	Wet Density	Dry Density	Reference Curve No.	Maximum Density	Optimum Moisture	Degree of Compaction
14.4 %	109.6 lb/ft³	(3) TH 10/13/76 ~~96.2~~ 95.8 lb/ft³	34	(1) 102.1 (2) 102.1 lb/ft³	(1) 14.1 (2) 14.1 %	(1) ~~94.2~~ 93.8 (2) 93.8 %

Remarks: EAST WALL WATERPROOFING TRENCH
SEE B0101ARRR

Tested By [signature] Emp.No. 3445
Calculated By [signature] Emp. No. 3445
Checked By [signature] Emp. No. 3182
Reviewed By [signature] Emp.No. 511

(1) Determined in field MAD 10-14-76
(2) Determined after lab verification
(3) Use oven dry for calculations, when available
(4) % wet wt/% dry wt

Q. A. REVIEW
BY [signature]
DATE 10-18-76

Roadbody Testing

In-Place Density Test-Rubber Balloon

Test Standard ASTM D2167

Project: Waterford SES Unit 3
Client: Ebasco Services, Inc.
Test Location E4 60N 27E
Test Depth 0:25
G.S. Elevation -37.00
Test Elevation -37.25
Sample I.D. MISS RIVER PUMP SAND

EB-SC REVIEWED W3-6497 TEB

Lab No. B0101AR
Test No. 4
Fill No. 5
Date 10/13/76
Time of Test 0927
Volumeter I.D. PT-154
Scale I.D. PT-076 Oven I.D. —
Speedy I.D. PT-193

1. Wt of Can & Damp Soil, 0.01 lb. 3.43
2. Tare Wt. of Can, 0.01 lb. 0.07
3. Net Wt. of Damp Soil, 0.01 lb. 3.36
4. Volume of Test Hole: .0305 ft³

Speedy Moisture, 12.0 / 13.6 % (4)

OVEN DRY-

5. Tare No. —
6. Wt. Tare & Wet Soil, gm. —
7. Wt. Tare & Dry Soil, gm. —
8. Wt. Water, gm. —
9. Wt. Tare, gm. —
10. Wt. of Dry Soil, gm. —
11. Moisture Content (8/10) —

SPEC. LIMITS ≤ 3% ABOVE OPTIMUM

EBASCO FIELD ACCEPTANCE

Retest Required: ✓ Yes ____ No
Retest of Lab No. B0101A and Date 10/13/76
Specification Requirement of Compaction 99 %
☐ Meets ☒ Does Not Meet Spec.
EBASCO QC Guilm. Jackson
DATE 10/13/76

Moisture Content	Wet Density	Dry Density	Reference Curve No.	Maximum Density	Optimum Moisture	Degree of Compactio
13.6 %	110.2 lb/ft³	(3) 97.0 lb/ft³	34	(1) 102.1 (2) 102.1 lb/ft³	(1) 14.1 (2) 14.1 %	(1) 95.0 (2) 95.0 %

Remarks: EAST WALL WATERPROOFING DITCH

SEE B0101ARR

Tested By G. Howard Emp. No. 3445
Calculated By G. Howard Emp. No. 3445
Checked By Hazen Emp. No. 3182
Reviewed By [illegible] Emp. No. [illegible]

(1) Determined in field MAD 10-14-76
(2) Determined after lab verification
(3) Use oven dry for calculations, when available
(4) % wet wt/% dry wt

Q. A. REVIEW
BY M Boyd
DATE 10-18-76

Form No. RBDB-00-6252

Reabody Testing

In-Place Density Test-Rubber Balloon

Test Standard ASTM D2167

REVIEWED W3-6497

oject: Waterford SES Unit 3
Client: Ebasco Services, Inc.
Test Location E4 60N 27E
Test Depth 0.25
G.S. Elevation -37.00
Test Elevation -37.25
Sample I.D. MISS RIVER PUMP SAND

Lab No. B0101A
Test No. 2
Fill No. 5
Date 10/13/76
Time of Test 0835
Volumeter I.D. PT-154
Scale I.D. PT-076 Oven I.D. PT-121
Speedy I.D. PT-193

1. Wt of Can & Damp Soil, 0.01 lb. 3.68
2. Tare Wt. of Can, 0.01 lb. 0.07
3. Net Wt. of Damp Soil, 0.01 lb. 3.61
   Speedy Moisture, 11.2 / 12.6 % (4)

4. Volume of Test Hole: .0328 ft³

OVEN DRY

5. Tare No. F
6. Wt. Tare & Wet Soil, gm. 702.5
7. Wt. Tare & Dry Soil, gm. 618.0
8. Wt. Water, gm. 84.5
9. Wt. Tare, gm. 17.2
10. Wt. of Dry Soil, gm. 600.8
11. Moisture Content (8/10) 14.1

SPEC. LIMITS ± 3% ABOVE OPTIMUM

EBASCO FIELD ACCEPTANCE

Retest Required: ✓ Yes ____ No
Retest of Lab No. —
and Date —
Specification Requirement of Compaction 95 %
☐ Meets ☒ Does Not Meet Spec.
EBASCO QC Edwin Parker
DATE 10/13/76

Moisture Content	Wet Density	Dry Density	Reference Curve No.	Maximum Density	Optimum Moisture	Degree of Compaction
14.1 %	110.1 lb/ft³	(3) 96.5 lb/ft³	34	(1) 102.1 / (2) 102.4 lb/ft³	(1) 14.1 / (2) 14.1 %	(1) 94.5 / (2) 94.5 %

Remarks: EAST WALL WATERPROOFING DITCH

Tested By G Hart Emp.No. 3445
Calculated By G Hart 3445 Emp. No. MAD 10-14-76
Checked By [illegible] Emp. No. 3182
Reviewed By [illegible] Emp.No.

(1) Determined in field
(2) Determined after lab verification
(3) Use oven dry for calculations, when available
(4) % wet wt/% dry wt

Q. A. REVIEW
BY [illegible]
DATE 10-18-76

Roadbody Testing — In-Place Density Test-Rubber Balloon

Test Standard ASTM D2167

Project: Waterford SES Unit 3
Client: Ebasco Services, Inc.
Test Location E4 GON 28E
Test Depth 0.25
G.S. Elevation -36.50
Test Elevation -36.75
Sample I.D. MISS RIVER PUMP SAND

Lab No. BOILOARRR TH 10/15
Test No. 8
Fill No. 5
Date 10/14/76
Time of Test 1230
Volumeter I.D. PT-154
Scale I.D. PT-072 Oven I.D. —
Speedy I.D. PT-193

1. Wt of Can & Damp Soil, 0.01 lb. 3.49
2. Tare Wt. of Can, 0.01 lb. 0.07
3. Net Wt. of Damp Soil, 0.01 lb. 3.42
4. Volume of Test Hole: .0295 ft

Speedy Moisture, 13.9 / 16.1 % (4)

OVEN DRY

5. Tare No. —
6. Wt. Tare & Wet Soil, gm. —
7. Wt. Tare & Dry Soil, gm. —
8. Wt. Water, gm. —
9. Wt. Tare, gm. —
10. Wt. of Dry Soil, gm. —
11. Moisture Content (8/10) —

SPEC. LIMITS ± 3% ABOVE OPTIMUM

EBASCO FIELD ACCEPTANCE

Retest Required: ✓ Yes / No

Retest of Lab No 10-8-76 BOILOARR and Date 10/14/76

Specification Requirement of Compaction 97 %

☐ Meets ☒ Does Not Meet Spec.

EBASCO QC [signature]

DATE 10/19/76

Moisture Content	Wet Density	Dry Density	Reference Curve No.	Maximum Density	Optimum Moisture	Degree Compact
16.1 %	115.9	(3) 99.8	36	(1) 103.1 / (2) 103.2	(1) [illegible] / (2) 14.5 %	(1) 96.8 / (2) 96.7
	lb/ft³	lb/ft³		lb/ft³		

Remarks: EAST WALL WATERPROOFING DITCH

See BOILOARRRR

Tested By [signature] Emp.No. 3445
Calculated By [signature] Emp. No. 3445
Checked By [signature] Emp. No. 3182
Reviewed By [signature] Emp.No. 411

(1) Determined in field
(2) Determined after lab verification
(3) Use oven dry for calculations, when available
(4) % wet wt/% dry wt

Q. A. REVIEW
BY [signature]
DATE 10-18-76

Peabody Testing

REVIEWED
TBS-6457
F-23

In-Place Density Test-Rubber Balloon

Test Standard ASTM D2167

Project: Waterford SES Unit 3

Client: Ebasco Services, Inc.

Test Location E4 60N 28E

Test Depth 0.25

G.S. Elevation -36.50

Test Elevation -36.75

Sample I.D. MISS RIVER PUMP. SAND

Lab No. ~~B0109 ARR~~ B0110 ARR

Test No. 7

Fill No. 5

Date ~~7220~~ 10/14/76

Time of Test 1220

Volumeter I.D. PT-154

Scale I.D. PT-072 ~~Oven I.D.~~

Speedy I.D. PT-193

1. Wt of Can & Damp Soil, 0.01 lb. 3.83
2. Tare Wt. of Can, 0.01 lb. 0.07
3. Net Wt. of Damp Soil, 0.01 lb. 3.76

Speedy Moisture, 14.8/17.4 % (4)

4. Volume of Test Hole: .0328

OVEN DRY

5. Tare No. —
6. Wt. Tare & Wet Soil, gm. —
7. Wt. Tare & Dry Soil, gm. —
8. Wt. Water, gm. —
9. Wt. Tare, gm. —
10. Wt. of Dry Soil, gm. —
11. Moisture Content (8/10) —

SPEC. LIMITS ≤ 3% ABOVE OPTIMUM

EBASCO FIELD ACCEPTANCE

Retest Required: ✓ Yes / No

Retest of Lab No. ~~B0109ARR~~ B0110AR

and Date 10/14/76

Specification Requirement of Compaction 99

☐ Meets ☒ Does Not Meet Spec

EBASCO QC [signature]

DATE 10/14/76

Moisture Content	Wet Density	Dry Density (3)	Reference Curve No.	Maximum Density	Optimum Moisture	Degree Compaction
17.4 %	114.6 lb/ft³	97.6 lb/ft³	36	(1) 103.1 (2) 103.2 lb/ft³	(1) 14.5 (2) 14.3 %	(1) 94.6 (2) 94.

Remarks: EAST WALL WATERPROOFING DITCH

See B0110ARRR

Tested By [signature] Emp. No. 3445

Calculated By [signature] Emp. No. 3445

Checked By [signature] Emp. No. 3182

Reviewed By [signature] Emp. No.

(1) Determined in field
(2) Determined after lab verification
(3) Use oven dry for calculations, when available
(4) % wet wt/% dry wt

Q. A. REVIEW

BY M. Ang J

DATE 10-18-76

Peabody Testing — In-Place Density Test-Rubber Balloon

Test Standard ASTM D2167

Project: Waterford SES Unit 3
Client: Ebasco Services, Inc.
Test Location E4 60N 28E
Test Depth 0.25
G.S. Elevation -36.50
Test Elevation -36.75
Sample I.D. MISS RIVER PUMP SAND

Lab No. B0110AR ~~B0109AR~~ TH 10/15/76
Test No. ~~F~~ 5 MI 10-18-76
Fill No. 4
Date 10/14/76
Time of Test 1140
Volumeter I.D. PT-154
Scale I.D. PT-076 Oven I.D. —
Speedy I.D. PT-193

1. Wt of Can & Damp Soil, 0.01 lb. 3.79
2. Tare Wt. of Can, 0.01 lb. .07
3. Net Wt. of Damp Soil, 0.01 lb. 3.72
4. Volume of Test Hole: .0312 ft
Speedy Moisture, 16.0/19.0 % (4)

OVEN DRY

5. Tare No. —
6. Wt. Tare & Wet Soil, gm. —
7. Wt. Tare & Dry Soil, gm. —
8. Wt. Water, gm. —
9. Wt. Tare, gm. —
10. Wt. of Dry Soil, gm. —
11. Moisture Content (8/10) —

SPEC. LIMITS
< 3% ABOVE OPTIMUM

EBASCO FIELD ACCEPTANCE

Retest Required: ✓ Yes / No
Retest of Lab No. B0110A ~~B0109A~~
and Date 10/14/76
Specification Requirement of Compaction 95 %
☐ Meets ☑ Does Not Meet Spec.
EBASCO QC Paul M. Clarke
DATE 10/14/76

Moisture Content	Wet Density	Dry Density	Reference Curve No.	Maximum Density	Optimum Moisture	Degree Compaction
19.0 %	119.2	(3) 100.2	36	(1) 103.1 (2) 103.2	(1) 17.4 (2) 17.1	(1) 97.2 (2) 97.1
	lb/ft³	lb/ft³		lb/ft³		

Remarks: EAST WALL WATERPROOFING DITCH

SEE B0110ARR

Tested By G. Hazel Emp. No. 3445
Calculated By G Hazel Emp. No. 3445
Checked By THAZEL Emp. No. 3182
Reviewed By [illegible] Emp. No. 511

(1) Determined in field
(2) Determined after lab verification
(3) Use oven dry for calculations, when available
(4) % wet wt/% dry wt

Q. A. REVIEW
BY [signature]
DATE 10-18-76

Peabody Testing — REVIEWED W3-6497

In-Place Density Test-Rubber Balloon

Test Standard ASTM D2167

Project: Waterford SES Unit 3
Client: Ebasco Services, Inc.
Test Location E4 60N 28E
Test Depth 0.25
G.S. Elevation -36.50
Test Elevation -36.75
Sample I.D. MISS RIVER PUMP SAND

Lab No. BOHOA ~~BOHO9A~~ TH 10/15/76
Test No. 3
Fill No. 5
Date 10/4/76
Time of Test 1040
Volumeter I.D. PT-154
Scale I.D. PT-026 Oven I.D. —
Speedy I.D. PT-193

1. Wt of Can & Damp Soil, 0.01 lb. 3.35
2. Tare Wt. of Can, 0.01 lb: 0.07
3. Net Wt. of Damp Soil, 0.01 lb. 3.28
   Speedy Moisture, 11.6/13.1 % (4)

4. Volume of Test Hole: .0315 ft

OVEN DRY

5. Tare No. —
6. Wt. Tare & Wet Soil, gm. —
7. Wt. Tare & Dry Soil, gm. —
8. Wt. Water, gm. —
9. Wt. Tare, gm. —
10. Wt. of Dry Soil, gm. —
11. Moisture Content (8/10) —

SPEC. LIMITS
< 3% ABOVE OPTIMUM

EBASCO FIELD ACCEPTANCE

Retest Required: ✓ Yes / No
Retest of Lab No. —
and Date —
Specification Requirement of Compaction 89
☐ Meets ☑ Does Not Meet Spec
EBASCO QC [signature]
DATE 10/14/76

Moisture Content	Wet Density	Dry Density	Reference Curve No.	Maximum Density	Optimum Moisture	Degree Compac
13.1 %	104.1 lb/ft³	(3) 92.0 lb/ft³	36	(1) 103.1 (2) 103.2 lb/ft³	(1) 17.1 (2) 16.5	(1) 89.2 (2) 89.1

Remarks: EAST WALL WATERPROOFING DITCH
SEE BO110AR

Tested By GAT Emp. No. 3445
Calculated By GAT Emp. No. 3445
Checked By THAZEL Emp. No. 3182
Reviewed By [illegible] Emp. No. 511

(1) Determined in field
(2) Determined after lab verification
(3) Use oven dry for calculations, when available
(4) % wet wt/% dry wt

Q. A. REVIEW
BY [signature]
DATE 10-18-76

Raybody Testing
Baltimore, Md. Lab

In-Place Density Test-Rubber Balloon

Test Standard ASTM D2167

TEB REVIEWED W3-6497 5-35-83

Project: Waterford SES Unit 3 — Lab No. B0090ARR
Client: Ebasco Services, Inc. — Test No. 1
Test Location E5 42N 27E — Fill No. 5
Test Depth 1.0 — Date 10/12/76
G.S. Elevation -35.75 — Time of Test 0930
Test Elevation -36.75 — Volumeter I.D. PT-154
Sample I.D. MISS RIVER PUMP SAND — Scale I.D. PT-072 Oven I.D. PT 121
Speedy I.D. PT-193

1.	Wt of Can & Damp Soil, 0.01 lb.	3.99	4. Volume of Test Hole: .0322 ft³
2.	Tare Wt. of Can, 0.01 lb.	0.07	
3.	Net Wt. of Damp Soil, 0.01 lb.	3.92	
	Speedy Moisture,	12.6 / 14.4 % (4)	

OVEN DRY

5.	Tare No.	—
6.	Wt. Tare & Wet Soil, gm.	—
7.	Wt. Tare & Dry Soil, gm.	—
8.	Wt. Water, gm.	—
9.	Wt. Tare, gm.	—
10.	Wt. of Dry Soil, gm.	—
11.	Moisture Content (8/10)	—

SPEC. LIMITS
-3% ABOVE OPTIMUM

EBASCO FIELD ACCEPTANCE

Retest Required: ____ Yes
✓ No
Retest of Lab No. —
and Date —
Specification Requirement of Compaction 99 %
☑ Meets ☐ Does Not Meet Spec.
EBASCO QC [signature]
DATE 10/12/76

Moisture Content	Wet Density	Dry Density	Reference Curve No.	Maximum Density	Optimum Moisture	Degree of Compaction
14.4 %	121.7 lb/ft³	(3) 106.4 lb/ft³	34	(1) 102.1 / (2) 102.1 lb/ft³	(1) 14.1 / (2) 14.1 %	(1) 104.2 / (2) 104.2 %

Remarks: WATERPROOFING TRENCH BACKFILL AREA.

Tested By G. Howard Emp.No. 3445 — Calculated By G. Howard Emp. No. 3445 — Checked By HAZEL Emp. No. 382 — Reviewed By [illegible] Emp.No. [illegible]

(1) Determined in field
(2) Determined after lab verification
(3) Use oven dry for calculations, when available
(4) % wet wt/% dry wt

Q. A. REVIEW
BY [signature]
DATE 10-18-76

From No. B808-09-6752

Roebody Testing

In-Place Density Test-Rubber Balloon

Test Standard ASTM D2167

Project: Waterford SES Unit 3
Client: Ebasco Services, Inc.
Test Location E5-42N, 27E
Test Depth 0.0
G.S. Elevation -36.75
Test Elevation -36.75
Sample I.D. Miss River Pump Sand

REVIEWED W3-6497 4-5-83

Lab No. B0090AR
Test No. 12
Fill No. 5
Date 10/11/76
Time of Test 1515
Volumeter I.D. PT-154
Scale I.D. PT072 Oven I.D. —
Speedy I.D. PT193

1. Wt of Can & Damp Soil, 0.01 lb. 4.00
2. Tare Wt. of Can, 0.01 lb. 1.07
3. Net Wt. of Damp Soil, 0.01 lb. 3.93
4. Volume of Test Hole: .0360 ft³

Speedy Moisture, 11.6 / 13.1 % (4)

OVEN DRY

5. Tare No. —
6. Wt. Tare & Wet Soil, gm. —
7. Wt. Tare & Dry Soil, gm. —
8. Wt. Water, gm. —
9. Wt. Tare, gm. —
10. Wt. of Dry Soil, gm. —
11. Moisture Content (8/10) —

SPEC. LIMITS ∠ 3% ABOVE OPTIMUM

EBASCO FIELD ACCEPTANCE

Retest Required: ✓ Yes ____ No
Retest of Lab No B0090A and Date 10/10/76
Specification Requirement of Compaction 99 %
☐ Meets ☒ Does Not Meet Spec.
EBASCO QC Bill M. Burke
DATE 10/11/76

Moisture Content	Wet Density	Dry Density	Reference Curve No.	Maximum Density	Optimum Moisture	Degree of Compaction
13.1 %	109.2 lb/ft³	(3) 96.6 lb/ft³	34	(1) 102.1 / (2) 102.1 lb/ft³	(1) 14.1 / (2) 14.1 %	(1) 94.6 / (2) 94.6 %

Remarks: See B0090AR for retest

Tested By G Howard Emp. No. 3445
Calculated By G Howard Emp. No. 3445
Checked By T Hazel Emp. No. 3182
Reviewed By [illegible] Emp. No. 5112

(1) Determined in field
(2) Determined after lab verification
(3) Use oven dry for calculations, when available
(4) % wet wt/% dry wt

Q. A. REVIEW
BY M Engel
DATE 10-18-76

Form No. R808.09.6752

Peabody Testing

In-Place Density Test-Rubber Balloon

Test Standard ASTM D2167

Project: Waterford SES Unit 3
Client: Ebasco Services, Inc.
Test Location ES-42N, 27E
Test Depth 0,0
G.S. Elevation -36.75
Test Elevation -36.75
Sample I.D. Miss River Pump Sand

TEB REVIEWED W3-6497 8-25-8?

Lab No. B0090A
Test No. 8
Fill No. 5
Date 10/11/76
Time of Test 1445
Volumeter I.D. PT 154
Scale I.D. PT0720 Oven I.D. —
Speedy I.D. PT 193

1. Wt of Can & Damp Soil, 0.01 lb. 3.13
2. Tare Wt. of Can, 0.01 lb. .107
3. Net Wt. of Damp Soil, 0.01 lb. 3.06
4. Volume of Test Hole: .0290 ft³
Speedy Moisture, 96/10.6% (4)

OVEN DRY

5. Tare No. —
6. Wt. Tare & Wet Soil, gm. —
7. Wt. Tare & Dry Soil, gm. —
8. Wt. Water, gm. —
9. Wt. Tare, gm. —
10. Wt. of Dry Soil, gm. —
11. Moisture Content (8/10) —

SPEC. LIMITS ∠ 3% ABOVE OPTIMUM

EBASCO FIELD ACCEPTANCE

Retest Required: ✓ Yes ☐ No
Retest of Lab No. —
and Date —
Specification Requirement of Compaction 99 %
☐ Meets ☑ Does Not Meet Spec.
EBASCO QC Bill M. Ruben
DATE 10/11/76

Moisture Content	Wet Density	Dry Density	Reference Curve No.	Maximum Density	Optimum Moisture	Degree of Compactic
10.6%	105.5 lb/ft³	95.4 (3) lb/ft³	34	(1) 102.1 / (2) 102.1 lb/ft³	(1) 14.1 / (2) 14.1 %	(1) 93.4 / (2) 93.4 %

Remarks: SEE B0090AR FOR RETEST

Tested By G. Hoover Emp.No. 3445
Calculated By G. Hoover Emp. No. 3445
Checked By [illegible] Emp. No. 3182
Reviewed By [illegible] Emp.No. 5117

(1) Determined in field
(2) Determined after lab verification
(3) Use oven dry for calculations, when available
(4) % wet wt/% dry wt

Q. A. REVIEW
BY M. Ruben
DATE 10-18-76

From No. 2B08.09-6752

Peabody Testing

In-Place Density Test-Rubber Balloon

Test Standard ASTM D2167 PB08-09

TEB REVIEWED W3-6497 8-7-76

Project: Waterford SES Unit 3 Lab No. ~~B0008A~~ JRM 9-22-76 (LRWE 706)

Client : Ebasco Services Inc. Test No. 2

Test Location F4-78W, 15S Fill No. 5B

Test Depth ~~-31.40~~ 6-25-76 Date 1/22/76

G.S. Elevation — Time of Test —

Test Elevation -36.40 Volumeter I.D. LRW 61

Sample I.D. ~~Miss River~~ Scale I.D. LRW 53

Pump Sand Speedy I.D. LRW 62

1. Wt. of Can & Damp Soil, 0.01 lb. 4.31
2. Tare Wt. of Can, 0.01 lb. .107
3. Net Wt. of Damp Soil, 0.01 lb. 4.24

Speedy Moisture, 14.7 %

4. Volume of Test Hole: .0364 ft^3

5. Tare No. —
6. Wt. Tare & Wet Soil, gm. —
7. Wt. Tare & Dry Soil, gm. —
8. Wt. Water, gm. —
9. Wt. Tare, gm. —
10. Wt. of Dry Soil, gm. —
11. Moisture Content (8/10) — %

Retest Required: ____ Yes / No

Retest of Lab No. —

& Date —

Specification Requirement of Compaction 95.0 %

☑ Meets ☐ Does Not Meet Spec.

Moisture Content	Wet Density	Dry Density	Reference Curve No.	Maximum Density	Optimum Moisture	Degree of Compaction
14.7 %	116.5 lb/ft^3	101.6 lb/ft^3	1	105.6 lb/ft^3	13.0 %	96.2 %

Remarks:

Technician: Hazel Calculated By: Hazel Checked By: [illegible]

Emp. No.: 3182 Emp. No.: 3182 Emp. No.: 3445

OR Meeter

Peabody Testing

In-Place Density Test-Rubber Balloon

Test Standard ASTM D2167 PB08-09

TAB REVIEWED W3.6497 8-T-52

JPM 9-22-76

Project: Waterford SES Unit 3 Lab No. ~~B0067A~~ (LRWE 705)

Client : Ebasco Services Inc. Test No. 1

Test Location F4-42W, 10N Fill No. 5B

Test Depth ~~36.40~~ 6-25-76 Date 1/22/76

G.S. Elevation - Time of Test -

Test Elevation -36.40 Volumeter I.D. LRW 61

Sample I.D. MSS River Pump Sand Scale I.D. LRW 53

Speedy I.D. LRW 62

1. Wt. of Can & Damp Soil, 0.01 lb. 3.78
2. Tare Wt. of Can, 0.01 lb. .07
3. Net Wt. of Damp Soil, 0.01 lb. 3.71

4. Volume of Test Hole: .0333 ft³

Speedy Moisture, 12.6 %

5. Tare No. -
6. Wt. Tare & Wet Soil, gm. -
7. Wt. Tare & Dry Soil, gm. -
8. Wt. Water, gm. -
9. Wt. Tare, gm. -
10. Wt. of Dry Soil, gm. -
11. Moisture Content (8/10) - %

Retest Required: ☐ Yes ✓ No

Retest of Lab No. -

& Date -

Specification Requirement of Compaction 95.0 %

☐ Meets ☑ Does Not Meet Spec.

Moisture Content	Wet Density	Dry Density	Reference Curve No.	Maximum Density	Optimum Moisture	Degree of Compaction
12.6 %	111.4 lb/ft³	98.9 lb/ft³	1	105.6 lb/ft³	13.0 %	93.7 %

Remarks: NO RETEST ASKED FOR BY EBASCO Q.C.

Technician: T Hazel Calculated By: T Hazel Checked By: [signature]

Emp. No.: T Hazel 3182 Emp. No.: 3182 Emp. No.: 3445

[signature]

Peabody Testing
BARROW AGEE LABORATORIES

REVIEWED W3-6497

LAB NO. 60116A

IN-PLACE DENSITY TEST — RUBBER BALLOON
Test Standard ASTM D2167

Project: Waterford SES Unit 3
Client: Ebasco Services, Inc.
Test Location E4 45N 27E
Test Depth 0.25
G. S. Elevation -36.00
Test Elevation -36.25
Sample I.D. MISS RIVER PUMP SAND

Test No. 3
Fill No. 5
Date 10/15/76
Time of Test 0950
Volumeter I.D. PT-154
Scale I.D. PT-076 Oven I.D. PT-122
Speedy I.D. PT-193

1. Weight of Can & Damp Soil, 0.01 lb. 3.71
2. Tare Weight of Can, 0.01 lb. 0.07
3. Net Weight of Damp Soil, 0.01 lb. 3.64
Speedy Moisture, 12.2 / 13.9 % (4)

4. Volume of Test Hole: .0330 ft³

OVEN DRY

5. Tare No. 8
6. Weight Tar & Wet Soil, gm. 700.5
7. Weight Tare & Dry Soil, gm. 602.4
8. Weight Water, gm. 98.1
9. Weight Tare, gm. 17.7
10. Weight of Dry Soil, gm. 584.7
11. Moisture Content (8/10) 16.8

SPEC. LIMITS
< 3% Above Optimum

EBASCO FIELD ACCEPTANCE

Restest Required: ✓ Yes ___ No
Retest of Lab No. -
and Date -
Specification Requirement of Compaction 99 %
☐ Meets ☑ Does Not Meet Specifications
Ebasco QC Bill M. Dickson
Date 10/16/76

Moisture Content	Wet Density	Dry Density	Reference Curve No.	Maximum Density	Optimum Moisture	Degree of Compaction
16.8 %	110.3 lb/ft³	(3) 94.4 lb/ft³	36	(1) 103.2 (2) 103.2 lb/ft³	(1) 17.1 (2) ~~16.5%~~ 17.1	(1) 91.5 (2) 91.5 %

Remarks: EAST WALL WATERPROOFING DITCH

Tested By G. Horwitz Employee No. 3445
Calculated By Gary Horwitz Employee No. 3445
Checked By THAZEL Employee No. 3182
Reviewed By [signature] Employee No. 5112

[1] Determined in field
[2] Determined after lab verification
[3] Use oven dry for calculations, when available
[4] % wet weight/% dry weight

Q. A. REVIEW
BY [signature]
DATE 10-20-76

FORM NO. PB08-09-6752

Peabody Testing

In-Place Density Test-Rubber Balloon

Test Standard ASTM D2167 PBG8-09

REVIEWED W3-6497 5-25-76

Project: Waterford SES Unit 3 Lab No. ~~B0054A~~ JRM 9-22-76 (LRW E 922)

Client : Ebasco Services Inc. Test No. 4

Test Location E3-25E, 24N Fill No. 5A

Test Depth — Date 5/20/76

G.S. Elevation — Time of Test —

Test Elevation -36.25 Volumeter I.D. 2RW 61

Sample I.D. Miss River Pump Sand Scale I.D. 2RW 53

Speedy I.D. 2RW 62

1. Wt. of Can & Damp Soil, 0.01 lb. 3.07
2. Tare Wt. of Can, 0.01 lb. .07
3. Net Wt. of Damp Soil, 0.01 lb. 3.00

4. Volume of Test Hole: .0284 ft³

Speedy Moisture, 9.1 %

5. Tare No. —
6. Wt. Tare & Wet Soil, gm. —
7. Wt. Tare & Dry Soil, gm. —
8. Wt. Water, gm. —
9. Wt. Tare, gm. —
10. Wt. of Dry Soil, gm. —
11. Moisture Content (8/10) — %

Retest Required: ___ Yes ✓ No

Retest of Lab No. — & Date —

Specification Requirement of Compaction 95.0 %

☑ Meets ☐ Does Not Meet Spec.

Moisture Content	Wet Density	Dry Density	Reference Curve No.	Maximum Density	Optimum Moisture	Degree of Compaction
9.1 %	105.6 lb/ft³	96.8 lb/ft³	7	101.3 lb/ft³	11.3 %	95.6 ~~95.8~~ %

CH 7/2/76

Remarks:

Technician: T Hazel Calculated By: T Hazel Checked By: G. Howard

Emp. No.: 3182 Emp: No.: 3182 Emp. No.: 3445

JRM 9-22-76

Peabody Testing

In-Place Density Test-Rubber Balloon

Test Standard ASTM D2167 PB08-09

Project: Waterford SES Unit 3 Lab No. ~~B00833A~~ JRM 9-22-76 (LRWE 921)

REVIEWED W3-6497 9-25

Client: Ebasco Services Inc. Test No. 3

Test Location E3-376, 241 Fill No. 5A

Test Depth — Date 5/20/76

G.S. Elevation — Time of Test —

Test Elevation -36.25 Volumeter I.D. 2RW61

Sample I.D. Miss River Pump Sand Scale I.D. 2RW53

Speedy I.D. 2RW62

1. Wt. of Can & Damp Soil, 0.01 lb. 3.47
2. Tare Wt. of Can, 0.01 lb. .07
3. Net Wt. of Damp Soil, 0.01 lb. 3.40

Speedy Moisture, 10.6 %

4. Volume of Test Hole: .0293 ft^3

5. Tare No. —
6. Wt. Tare & Wet Soil, gm. —
7. Wt. Tare & Dry Soil, gm. —
8. Wt. Water, gm. —
9. Wt. Tare, gm. —
10. Wt. of Dry Soil, gm. —
11. Moisture Content (8/10) — %

Retest Required: ____ Yes ✓ No

Retest of Lab No. —

& Date —

Specification Requirement of Compaction 95.0 %

☑ Meets ☐ Does Not Meet Spec.

Moisture Content	Wet Density	Dry Density	Reference Curve No.	Maximum Density	Optimum Moisture	Degree of Compaction
10.6 %	~~114.9~~ 116.0 lb/ft^3 G# 7/2/76	~~104.8~~ 104.9 lb/ft^3 G# 7/2/76	2	103.1 lb/ft^3	~~10.7~~ 15.0 % JRM 6/25/76	~~101.8~~ 101.7 % GH 7/2/76

Remarks: _____

Technician: Hazel Calculated By: Hazel Checked By: G. Beu. H

Emp. No.: 3182 Emp. No.: 3182 Emp. No.: 3445

JRM 6-25-76

Raabody Testing

In-Place Density Test-Rubber Balloon

Test Standard ASTM D2167

Project: Waterford SES Unit 3
Client: Ebasco Services, Inc.
Test Location E5 58N 27E
Test Depth 0.5
G.S. Elevation -35.75
Test Elevation -36.25
Sample I.D. MISS RIVER PUMP SAND

REVIEWED FEB W3-6497

Lab No. B0097AR
Test No. 4
Fill No. 5
Date 10/12/76
Time of Test 1240
Volumeter I.D. PT-154
Scale I.D. PT-081 Oven I.D. —
Speedy I.D. PT-193

1. Wt of Can & Damp Soil, 0.01 lb. 1912g = 4.22
2. Tare Wt. of Can, 0.01 lb. " 0.07
3. Net Wt. of Damp Soil, 0.01 lb. 4.15
   Speedy Moisture, 12.0 / 13.6 % (4)

4. Volume of Test Hole: .0330 ft³

OVEN DRY

5. Tare No. —
6. Wt. Tare & Wet Soil, gm. —
7. Wt. Tare & Dry Soil, gm. —
8. Wt. Water, gm. —
9. Wt. Tare, gm. —
10. Wt. of Dry Soil, gm. —
11. Moisture Content (8/10) —

SPEC. LIMITS
< 3% ABOVE OPTIMUM

EBASCO FIELD ACCEPTANCE

Retest Required: ___ Yes
✓ No
Retest of Lab No. B0097A
and Date 10/12/76
Specification Requirement of Compaction 99 %
☑ Meets ☐ Does Not Meet Spec.
EBASCO QC Bill M. Dukes
DATE 10/12/76

Moisture Content	Wet Density	Dry Density	Reference Curve No.	Maximum Density	Optimum Moisture	Degree of Compactio
13.6 %	125.8	(3) 110.7	34	(1) 109.1 / (2) 102.1	(1) 14.1 / (2) 14.1 %	(1) 108.4 / (2) 108.4 %
	lb/ft³	lb/ft³		lb/ft³		

Remarks: WATERPROOFING TRENCH BACKFILL AREA

Tested By G Hunt Emp.No. 3445
Calculated By G Hunt Emp. No. 3445
Checked By T HAZEL Emp. No. 3182
Reviewed By [illegible] Emp.No. 5112

(1) Determined in field
(2) Determined after lab verification
(3) Use oven dry for calculations, when available
(4) % wet wt/% dry wt

Q. A. REVIEW
BY M Bryant
DATE 10-18-76

From No. PB08-09-6752

Peabody Testing

In-Place Density Test-Rubber Balloon

Test Standard ASTM D2167

Project: Waterford SES Unit 3
Client: Ebasco Services, Inc.
Test Location E5 46N 27E
Test Depth 0.5
G.S. Elevation ~~35.75~~ -35.75 MI 10-18-76
Test Elevation -36.25
Sample I.D. MISS RIVER PUMP SAND

REVIEWED 10/13/76 W3-6497

Lab No. B0097A ~~B0079A~~ GH 10/12/76
Test No. 2
Fill No. 5
Date 10/12/76
Time of Test 0945
Volumeter I.D. PT-154
Scale I.D. PT-072 Oven I.D. PT-121
Speedy I.D. PT-193

1. Wt of Can & Damp Soil, 0.01 lb. 4.03
2. Tare Wt. of Can, 0.01 lb. 0.07
3. Net Wt. of Damp Soil, 0.01 lb. 3.96
4. Volume of Test Hole: .0343 ft³

Speedy Moisture, 15.3 / 18.0 % (4)

OVEN DRY

5. Tare No. 14
6. Wt. Tare & Wet Soil, gm. 730.5
7. Wt. Tare & Dry Soil, gm. 604.8
8. Wt. Water, gm. 125.7
9. Wt. Tare, gm. 17.4
10. Wt. of Dry Soil, gm. 587.0
11. Moisture Content (8/10) 21.4

SPEC. LIMITS ∠ 3% ABOVE OPTIMUM

EBASCO FIELD ACCEPTANCE

Retest Required: ✓ Yes ____ No
Retest of Lab No. —
and Date —
Specification Requirement of Compaction 97 %
☐ Meets ☑ Does Not Meet Spec.
EBASCO QC Gene M. Quirk
DATE 10/12/76

Moisture Content	Wet Density	Dry Density	Reference Curve No.	Maximum Density	Optimum Moisture	Degree of Compactio
21.4 %	115.4 lb/ft³	(3) 95.0 lb/ft³	34	(1) 102.1 / (2) 102.1 lb/ft³	(1) 14.1 / (2) 14.1 %	(1) 93.0 / (2) 93.0 %

Remarks: EAST WALL WATERPROOFING TRENCH
See B0097AR

Tested By G Hewitt Emp.No. 3445
Calculated By G Hewitt Emp. No. 3445
Checked By THAzel Emp. No. 3182
Reviewed By [illegible] Emp.No. 3112

(1) Determined in field
(2) Determined after lab verification
(3) Use oven dry for calculations, when available
(4) % wet wt/% dry wt

Q. A. REVIEW
BY [signature]
DATE 10-18-76

From No. PB08-09-6752

Peabody Testing

In-Place Density Test-Rubber Balloon

Test Standard ASTM D2167 PB08-09

REVIEWED W3-6497 6-25-82

Project: Waterford SES Unit 3 Lab No. ~~B0061A~~ JAM 9-22-76 (LRWE 816)

Client : Ebasco Services Inc Test No. 2

Test Location F4-84w,80s Fill No. 5A

Test Depth ~~-32.5~~ -37.5 6-25-76 Date 2/26/76

G.S. Elevation — Time of Test —

Test Elevation -37.25 Volumeter I.D. LRW 61

Sample I.D. Miss River Pump Sand Scale I.D. LRW 53

Speedy I.D. LRW 62

1. Wt. of Can & Damp Soil, 0.01 lb. 3.87
2. Tare Wt. of Can, 0.01 lb. .07
3. Net Wt. of Damp Soil, 0.01 lb. 3.80

4. Volume of Test Hole: .0338 ft³

Speedy Moisture, 10.5 %

5. Tare No. —
6. Wt. Tare & Wet Soil, gm. —
7. Wt. Tare & Dry Soil, gm. —
8. Wt. Water, gm. —
9. Wt. Tare, gm. —
10. Wt. of Dry Soil, gm. —
11. Moisture Content (8/10) — %

Retest Required: ☐ Yes ✓ No

Retest of Lab No. —

& Date —

Specification Requirement of Compaction 95.0 %

☑ Meets ☐ Does Not Meet Spec.

Moisture Content	Wet Density	Dry Density	Reference Curve No.	Maximum Density	Optimum Moisture	Degree of Compaction
10.5 %	112.4 lb/ft³	101.7 lb/ft³	6	102.9 lb/ft³	12.5 %	~~98.9~~ 98.8 %

C.# 7/2/76

Remarks:

Technician: Hazel Calculated By: Hazel Checked By: G. Howell

Emp. No.: 3182 Emp. No.: 3182 Emp. No.: 3445

JR McCuen

Peabody Testing

In-Place Density Test-Rubber Balloon

Test Standard ASTM D2167 PB08-09

TEB REVIEWED W3-6497 9-25-85

Project: Waterford SES Unit 3 Lab No. ~~B0062A~~ (LRWE 818) JRM 9-22-76

Client : Ebasco Services Inc. Test No. 3

Test Location F4-8aw, 85s Fill No. '5A

Test Depth ~~-37.25~~ SM Boudreaux 6-25-76 Date 2/26/76

G.S. Elevation — Time of Test —

Test Elevation ~~-37.25~~ AI 8-12-76 Volumeter I.D. LRW61

Sample I.D. Miss River Scale I.D. LRW53

Pump Sand Speedy I.D. LRW62

1. Wt. of Can & Damp Soil, 0.01 lb. 3.43
2. Tare Wt. of Can, 0.01 lb. 1.07
3. Net Wt. of Damp Soil, 0.01 lb. 3.36

Speedy Moisture, 13.3 %

4. Volume of Test Hole: ~~.1035~~ Hayl 6/24/76 .1036 ft³
5. Tare No. —
6. Wt. Tare & Wet Soil, gm. —
7. Wt. Tare & Dry Soil, gm. —
8. Wt. Water, gm. —
9. Wt. Tare, gm. —
10. Wt. of Dry Soil, gm. —
11. Moisture Content (8/10) — %

Retest Required: ____ Yes ✓ No

Retest of Lab No. —

& Date —

Specification Requirement of Compaction 95.0 %

☑ Meets ☐ Does Not Meet Spec.

Moisture Content	Wet Density	Dry Density	Reference Curve No.	Maximum Density	Optimum Moisture	Degree of Compaction
13.3 %	117.5 lb/ft³	103.7 lb/ft³	6	102.9 lb/ft³	12.5 %	~~102.4~~ 100.8 %

GH. 7/2/76

Remarks:

Technician: Hayl Calculated By: Hayl Checked By: G. Howlett

Emp. No.: 3182 Emp. No.: 3182 Emp. No.: 3445

JRM

Peabody Testing
Dallas-Austin Labs

In-Place Density Test-Rubber Balloon

Test Standard ASTM D2167

Project: Waterford SES Unit 3
Client: Ebasco Services, Inc.
Test Location ES-40N, 27E
Test Depth .50
G.S. Elevation -36.75
Test Elevation -37.25
Sample I.D. Miss River Pump Sand

Lab No. B0089A
Test No. 7
Fill No. 5
Date 10/11/76 ~~10/10/76~~
Time of Test ~~1410~~ 1440
Volumeter I.D. PT 154
Scale I.D. PT072 Oven I.D. PT122
Speedy I.D. PT193

TEB REVIEWED W3-6497 4-25-87

1.	Wt of Can & Damp Soil, 0.01 lb.	3.40	
2.	Tare Wt. of Can, 0.01 lb.	.07	
3.	Net Wt. of Damp Soil, 0.01 lb.	3.33	
	Speedy Moisture,	15.2/17.9 % (4)	
	OVEN DRY ✓		
4.	Volume of Test Hole:	.0260 ft³	
5.	Tare No.	28	
6.	Wt. Tare & Wet Soil, gm.	702.1	
7.	Wt. Tare & Dry Soil, gm.	597.2	
8.	Wt. Water, gm.	104.9	
9.	Wt. Tare, gm.	16.9	
10.	Wt. of Dry Soil, gm.	580.3	
11.	Moisture Content (8/10)	18.1	

SPEC. LIMITS
< 3% ABOVE OPTIMUM

EBASCO FIELD ACCEPTANCE

Retest Required: ☐ Yes ☑ No
Retest of Lab No. —
and Date —
Specification Requirement of Compaction 89 %
☑ Meets ☐ Does Not Meet Spec
EBASCO QC Bill M. Ruben
DATE 10/11/76

Moisture Content	Wet Density	Dry Density	Reference Curve No.	Maximum Density	Optimum Moisture	Degree of Compaction
18.1 %	128.1	(3) 108.5	34	(1) 102.1 / (2) 102.1	(1) 14.1 / (2) 14.1 %	(1) 106.3 / (2) 106.3 %
	lb/ft³	lb/ft³		lb/ft³		

Remarks:

Tested By G. Hom Calculated By G. Hom Checked By ~~Hom~~ Reviewed By
Emp.No. 3445 Emp. No. 3445 Emp. No. 3182 Emp.No. 511

(1) Determined in field
(2) Determined after lab verification
(3) Use oven dry for calculations, when available
(4) % wet wt/% dry wt

Q. A. REVIEW
BY M Ingo
DATE 10-18-76

From No. 2808-09-6752

Peabody Testing

In-Place Density Test-Rubber Balloon

Test Standard ASTM D2167

REVIEWED W3-6497 TD

Project: Waterford SES Unit 3 — Lab No. B0101ARRRRRRRR

Client: Ebasco Services, Inc. — Test No. 18

Test Location EY 60N 27E. — Fill No. 5

Test Depth 0:50 — Date 10/14/76

G.S. Elevation -36.50 — Time of Test 1830

Test Elevation -37.00 — Volumeter I.D. PT-154

Sample I.D. MISS RIVER PUMP SAND — Scale I.D. PT-076 — Oven I.D. —

Speedy I.D. PT-193

1.	Wt of Can & Damp Soil, 0.01 lb.	3.34
2.	Tare Wt. of Can, 0.01 lb.	0.07
3.	Net Wt. of Damp Soil, 0.01 lb.	3.27
	Speedy Moisture,	12.9 / 14.8 % (4)

4. Volume of Test Hole: .0278 ft³

OVEN DRY

5.	Tare No.	—
6.	Wt. Tare & Wet Soil, gm.	—
7.	Wt. Tare & Dry Soil, gm.	—
8.	Wt. Water, gm.	—
9.	Wt. Tare, gm.	—
10.	Wt. of Dry Soil, gm.	—
11.	Moisture Content (8/10)	—

SPEC. LIMITS
< 3% ABOVE OPTIMUM

EBASCO FIELD ACCEPTANCE

Retest Required: ☐ Yes ☑ No

Retest of Lab No. B0101ARRRRRRR and Date 10/14/76

Specification Requirement of Compaction 99 %

☑ Meets ☐ Does Not Meet Spec

EBASCO QC [signature]

DATE 10/19/76

Moisture Content	Wet Density	Dry Density	Reference Curve No.	Maximum Density	Optimum Moisture	Degree Compact
14.8 %	117.6	(3) 102.4	36	(1) 103.1 / (2) 103.2	(1) 14.8 / (2) +3%	(1) 99.3 / (2) 99.2
	lb/ft³	lb/ft³		lb/ft³		

Remarks: EAST WALL WATERPROOFING DITCH

Tested By [signature] Emp.No. 3445 — Calculated By [signature] Emp. No. 3445 — Checked By [signature] Emp. No. 3182 — Reviewed By [signature] Emp.No. 5112

(1) Determined in field
(2) Determined after lab verification
(3) Use oven dry for calculations, when available
(4) % wet wt/% dry wt

Q. A. REVIEW
BY M. Eng
DATE 10-18-76

Peabody Testing

In-Place Density Test-Rubber Balloon

Test Standard ASTM D2167

REVIEWED W3-6497 TLB 9-25-76

Project: Waterford SES Unit 3
Client: Ebasco Services, Inc
Test Location E4 60N 27E
Test Depth 0.50
G.S. Elevation -36.50
Test Elevation -37.00
Sample I.D. MISS RIVER PUMP SAND

Lab No. B0101AR2RRRRR
Test No. 17
Fill No. 5
Date 10/14/76
Time of Test 1735
Volumeter I.D. PT-154
Scale I.D. PT-076 Oven I.D. —
Speedy I.D. PT-193

1. Wt of Can & Damp Soil, 0.01 lb. 3.70
2. Tare Wt. of Can, 0.01 lb. 0.07
3. Net Wt. of Damp Soil, 0.01 lb. 3.63
   Speedy Moisture, 13.6 / 15.7 % (4)

4. Volume of Test Hole: .0309 ft

OVEN DRY

5. Tare No. —
6. Wt. Tare & Wet Soil, gm. —
7. Wt. Tare & Dry Soil, gm. —
8. Wt. Water, gm. —
9. Wt. Tare, gm. —
10. Wt. of Dry Soil, gm. —
11. Moisture Content (8/10) —

SPEC. LIMITS
< 3% ABOVE OPTIMUM

EBASCO FIELD ACCEPTANCE

Retest Required: ✓ Yes
No
Retest of Lab No. B0101AR2RRRRR
and Date 10/14/76
Specification Requirement of Compaction 99 %
☐ Meets ☑ Does Not Meet Spec
EBASCO QC [signature]
DATE 10/14/76

Moisture Content	Wet Density	Dry Density	Reference Curve No.	Maximum Density	Optimum Moisture	Degree Compact
15.7 %	117.5 lb/ft³	(3) 101.6 lb/ft³	36	(1) 103.1 (2) 103.2 lb/ft³	(1) (2)	(1) 98.5 (2) 98.4

Remarks: EAST WALL WATERPROOFING TRENCH

SEE B0101ARRRRRRRRR

Tested By [signature] Emp.No. 3445
Calculated By [signature] Emp. No. 3445
Checked By [signature] Emp. No. 3182
Reviewed By [signature]

(1) Determined in field
(2) Determined after lab verification
(3) Use oven dry for calculations, when available
(4) % wet wt/% dry wt

Q. A. REVIEW
BY [signature]
DATE 10-18-76

Form No. 2809-00-6752

Peabody Testing

In-Place Density Test-Rubber Balloon

Test Standard ASTM D2167

Project: Waterford SES Unit 3
Client: Ebasco Services, Inc
Test Location E4 60N 27E
Test Depth 0.5
G.S. Elevation -36.50
Test Elevation -37.00
Sample I.D. MISS RIVER PUMP SAND

REVIEWED W3-6497 8-29-87 TEB

Lab No. B0101ARRRRRRR
Test No. 13
Fill No. 5
Date 10/14/76
Time of Test 1530
Volumeter I.D. PT-154
Scale I.D. PT-076 Oven I.D. —
Speedy I.D. PT-193

1. Wt of Can & Damp Soil, 0.01 lb. 380
2. Tare Wt. of Can, 0.01 lb. 0.07
3. Net Wt. of Damp Soil, 0.01 lb. 3.73
   Speedy Moisture, 15.4 / 18.2 % (4)

4. Volume of Test Hole: .0323 ft

OVEN DRY

5. Tare No. —
6. Wt. Tare & Wet Soil, gm. —
7. Wt. Tare & Dry Soil, gm. —
8. Wt. Water, gm. —
9. Wt. Tare, gm. —
10. Wt. of Dry Soil, gm. —
11. Moisture Content (8/10) —

SPEC. LIMITS
< 3% ABOVE OPTIMUM

EBASCO FIELD ACCEPTANCE

Retest Required: ✓ Yes
No
Retest of Lab No. B0101RRRRR
and Date 10/14/76
Specification Requirement of Compaction 97 %
☐ Meets ☑ Does Not Meet Spec
EBASCO QC [signature]
DATE 10/19/76

Moisture Content	Wet Density	Dry Density	Reference Curve No.	Maximum Density	Optimum Moisture	Degree Compact
18.2 %	115.5	(3) 97.7	36	(1) 103.1 / (2) 103.2	(1) n.t. / (2) 14.5 % n.t.	(1) 94.8 / (2) 94.7
	lb/ft³	lb/ft³		lb/ft³		

Remarks: EAST WALL WATERPROOFING DITCH
See B0101ARRRRRRR

Tested By [signature] Emp.No. 3445
Calculated By [signature] Emp. No. 3445
Checked By THAZA Emp. No. 3182
Reviewed By [signature] Emp.No. 511

(1) Determined in field
(2) Determined after lab verification
(3) Use oven dry for calculations, when available
(4) % wet wt/% dry wt

Q. A. REVIEW
BY [signature]
DATE 10-18-76

Peabody Testing

In-Place Density Test-Rubber Balloon

Test Standard ASTM D2167

REVIEWED W3-6497 10-23-76

Project: Waterford SES Unit 3 — Lab No. B0101ARRRRRR
Client: Ebasco Services, Inc — Test No. 12
Test Location E4 60N 27E. — Fill No. 5th lift 4 5
Test Depth 0.5 — Date 10/14/76
G.S. Elevation -36.50 — Time of Test 1415
Test Elevation -37.00 — Volumeter I.D. PT-154
Sample I.D. MISS RIVER PUMP SAND — Scale I.D. PT-072 Oven I.D. —
Speedy I.D. PT-193

1. Wt of Can & Damp Soil, 0.01 lb. 3.83
2. Tare Wt. of Can, 0.01 lb. 0.07
3. Net Wt. of Damp Soil, 0.01 lb. 3.76
4. Volume of Test Hole: .0325 ft³

Speedy Moisture, 14.5 / 17.0 % (4)

OVEN DRY

5. Tare No. —
6. Wt. Tare & Wet Soil, gm. —
7. Wt. Tare & Dry Soil, gm. —
8. Wt. Water, gm. —
9. Wt. Tare, gm. —
10. Wt. of Dry Soil, gm. —
11. Moisture Content (8/10) —

SPEC. LIMITS
< 3% ABOVE OPTIMUM

EBASCO FIELD ACCEPTANCE

Retest Required: ✓ Yes ____ No
Retest of Lab No. B0101ARRRR and Date 10/19/76
Specification Requirement of Compaction 99 %
☐ Meets ☒ Does Not Meet Spec
EBASCO QC [signature]
DATE 10/19/76

Moisture Content	Wet Density	Dry Density	Reference Curve No.	Maximum Density	Optimum Moisture	Degree of Compaction
17.0 %	115.7 lb/ft³	(3) 98.9 lb/ft³	36	(1) 103.1 / (2) 103.2 lb/ft³	(1) 17.5 / (2) 17.1	(1) 95.9 / (2) 95.8

Remarks: EAST WALL WATERPROOFING DITCH

SEE B0101ARRRRRR

Tested By [signature] Emp.No. 3445 — Calculated By [signature] Emp. No. 3446 — Checked By [signature] Emp. No. 3482 — Reviewed By [signature] Emp.No. 3112

(1) Determined in field
(2) Determined after lab verification
(3) Use oven dry for calculations, when available
(4) % wet wt/% dry wt

Q. A. REVIEW
BY [signature]
DATE 10-18-76

Form No. 0808-00-6752

RESPONSE

ITEM NO.: 21

TITLE: LP&L QA Construction System Status and Transfer Reviews

NRC DESCRIPTION OF CONCERN:

The Inquiry Team assessment of the Ebasco QA disposition of LP&L QA Construction documentation and walk-through hardware findings for a sample of the sixty-seven systems transferred to LP&L operations resulted in NRC questions on the adequacy of Ebasco and LP&L QA Construction disposition of those findings. As a result of the NRC questions LP&L and Ebasco QA initiated a review to ensure that all LP&L QA Construction findings were adequately dispositioned. Ebasco QA had identified 15 systems or subsystems (Nos. 18-3, 36-1, 36-3, 43B, 43B9, 46C, 46E, 46H, 55A, 59, 69B, 71B2, 72A and 91E) where the LP&L findings may not have been properly dispositioned during the transfer of these systems to LP&L operations.

Based on the above, LP&L is requested to complete the review of all significant LP&L status and transfer review findings, such as undersized welds and other hardware walk-through and documentation findings. This review should ensure that these findings have been properly closed out or identified to LP&L operations for their closeout. For any LP&L open findings not properly identified on the status or transfer letters to LP&L operations, LP&L should determine whether this condition adversely affected the testing conducted for those systems.

DISCUSSION:

LP&L has completed its review of Construction QA system documentation and walkthrough hardware comments to ensure that these comments have been adequately dispositioned. This review included both "Status" and "Transfer" comments. All significant comments have been properly closed out or identified to LP&L Plant Staff on the Master Tracking System (MTS).

The term "Status" refers to the point at which a Startup System (SUS) becomes the responsibility of LP&L Startup. The system may not be 100% complete, but it is considered complete enough to facilitate testing by LP&L Startup. The LP&L Construction QA Status review determines whether or not the documentation accurately reflects the status of the system and whether the documentation is acceptable. The organizational elements involved in this phase are Construction, QA and Startup. Per the established startup program, Plant Staff is only involved in the Transfer phase.

The term "Transfer" refers to the conveyance of jurisdiction of a SUS from LP&L Startup to Plant Staff following construction completion and preoperational testing. The LP&L Construction QA final review and acceptance of the system documentation is a prerequisite to acceptance of the system by Plant Staff and is documented in a Construction QA letter to LP&L Startup for inclusion in the system transfer package.

During the transfer review process, comments generated by LP&L Construction QA are returned to Ebasco QA for resolution. The majority of the comments pertain to documentation deficiencies. However, any comments that are hardware impacting (i.e., requiring rework or engineering evaluation) are processed using Deficiency Notices (DN's) or Nonconformance Reports (NCR's) and are identified and tracked by the Master Tracking System (MTS) until they are formally closed. If deficiencies are still open when the LP&L Construction QA Transfer letter is issued to LP&L Startup, they are referenced in the letter. This is done in order to allow the Plant Staff to make informed decisions regarding acceptance of system jurisdiction and to assure continuity of deficiency awareness through the transfer process. The Construction QA letter is updated by the Startup Transfer Group to the time the system is submitted to Plant Staff for transfer and is included in the transfer package.

Under the above process, resolution of all significant LP&L Construction QA comments should be accomplished prior to transfer of each system.

Comments not impacting on hardware need not be resolved prior to transfer. At the time of the Inquiry Team assessment, LP&L and Ebasco were in the midst of the transfer review process. The listing of 15 systems given to the NRC during the Inquiry Team assessment included those systems preliminarily identified as having LP&L QA comments to which Ebasco had not yet responded. This listing should be corrected as follows: System 43B9 should be system 46B, system 69B should be system 60B, and system 56A was left out and should be added. Further investigation revealed that systems 46C and 72A had been adequately responded to by Ebasco QA. The remaining 13 systems had outstanding comments. These have been responded to and have been accepted by LP&L QA. Of the 13 systems, 7 were classified as "accepted with comments". This means that LP&L QA accepted the system with comments that were not considered to be hardware impacting and, therefore, need not have been responded to by Ebasco QA prior to system transfer. Of the remaining 6 systems, 46E had not yet been submitted for transfer. Three other systems (43B, 36-1 and 36-3), which had comments concerning undersized welds, were submitted for transfer on the assumption that the referenced welds had been reinspected and were accepted under the resolution of SCD 74 (which addresses such undersized welds generically). The referenced welds have now been reinspected and are acceptable. The last two systems (46B and 59) of the six were transferred because the comments were resolved prior to the LP&L Construction QA letter being written. The formal response from Ebasco had not been transmitted.

LP&L has performed an overall review of hardware and software comments generated during Status and Transfer of safety-related systems. This review of comments was to determine if there were generic implications or significant trends. There were no generic problems or trends identified other than those previously processed in accordance with Waterford-3 Site QA Program requirements (e.g. SCDs 57, 60 and 74). This review is documented in the File Memo W3K84-1148, dated 5/14/84.

Ebasco QA conducted a surveillance (SMR-84-6-1, dated 6/20/84) of their Status files which verified that Ebasco QA had submitted complete responses to all LP&L QA comments. No additional outstanding correspondence was found during this review. This was confirmed by LP&L QA.

In conclusion, LP&L found no significant open comments that were not included in the Status or Transfer letters to LP&L Startup which would have adversely affected the testing conducted for these systems. In addition, no significant comments were found which were not resolved or identified on the MTS per existing procedure at the time it was recommended to the Plant Manager that the SUS be accepted.

CAUSE:

The NRC was concerned that Construction QA comments were not being resolved in a timely fashion. The process of closing status comments was in progress at the time of the inquiry team assessment, but had not been completed.

In all cases except for undersized welds, resolution in fact was not untimely. In the case concerning undersized welds, comment responses arguably should have been provided prior to transfer. Comment responses on undersized welds were not required prior to transfer due to a misunderstanding as to the need for system specific weld reinspection because it was believed that these welds were covered by SCD-74.

GENERIC IMPLICATIONS:

None.

SAFETY SIGNIFICANCE:

A review by LP&L Startup and Plant Staff of the comments, other than those processed as DNs or NCRs, for the systems listed in the NRC concern determined that none were significant or would have impacted testing or system operation.

CORRECTIVE ACTION PLAN/SCHEDULE:

As shown above, the Status and Transfer reviews have been satisfactorily closed-out. Furthermore, the Plant Staff will be promptly notified if and when any significant problems are subsequently identified on a system. The identification and notification will be accomplished via the CIWA (Condition Identification Work Authorization) process.

ATTACHMENTS:

1) Disposition of System Status and Transfer Reviews

2) Description of System Status and Transfer Reviews

REFERENCES:

All letters referenced in Attachment 1.

ATTACHMENT 1

DISPOSITION OF SYSTEM STATUS AND TRANSFER REVIEWS*

SUS	LP&L COMMENTS	EBASCO RESPONSE	LP&L ACCEPTANCE
18-3	W3K-83-0648 (5/18/83)	W3-QAIRG-0572 (6/20/83)	W3K84-0853 (6/22/83)
		W3-QAIRG-1405 (5/9/84)	W3K84-1271 (5/28/84)
36-1	W3K-83-0197 (2/17/83)	W3-QAIRG-0342 (2/24/83)	W3K84-1654 (7/19/84)
		W3-QAIRG-1439 (6/7/84)	W3K84-1654 (7/19/84)
		W3-QAIRG-1439 S1 (7/19/84)	W3K84-1654 (7/19/84)
36-3	W3K-82-183 (2/16/83)	W3-QAIRG-0339 (2/22/83)	W3K84-1560 (7/5/84)
		W3-QAIRG-1440 (6/7/84)	W3K84-1560 (7/5/84)
	W3K-83-210 (2/18/83)	W3-QAIRG-1448 (6/13/84)	W3K84-1560 (7/5/84)
43B	W3K-83-0195 (2/17/83)	W3-QAIRG-0346 (2/25/83)	W3K84-1561 (7/5/84)
		W3-QAIRG-1441 (6/7/84)	W3K84-1561 (7/5/84)
46B	W3K-83-0613 (5/10/83)	W3-QAIRG-0556 (6/14/83)	W3K84-1250 (6/4/84)
		W3-QAIRG-1450 (6/17/84)	W3K84-1250 (6/4/84)
	W3K-83-210 (2/18/83)	W3-QAIRG-1396 (5/4/84)	W3K84-1250 (6/4/84)
46C	W3K-83-0196 (2/17/83)	W3-QAIRG-0348 (2/28/83)	W3K84-1562 (7/6/84)
		W3-QAIRG-1399 (5/4/84)	W3K84-1562 (7/6/84)
46E	W3K-83-728 (5/31/83)	W3-QAIRG-0544 (6/10/83)	W3K84-1599 (7/12/84)
		Q.S.E.-1001 (4/11/84)	None Required
		W3-QA-28118 (4/17/84)	W3K84-1599 (7/12/84)
	W3K-83-0342 (3/17/83)	W3-QAIRG-0436 (4/14/83)	W3K84-1599 (7/12/84)
		W3-QAIRG-1372 (4/17/84)	W3K84-1599 (7/12/84)
	W3K-83-0343 (3/18/83)	W3-QAIRG-1442 (6/7/84)	W3K84-1599 (7/12/84)
46H	W3K-83-0450 (4/8/83)	W3-QAIRG-0483 (5/13/83)	W3K84-1453 (6/22/84)
		W3-QAIRG-0483 S1 (6/21/84)	W3K84-1453 (6/22/84)
55A	W3K-83-0688 (5/26/83)	W3-QAIRG-0545 (6/10/83)	W3K84-0769 (4/2/84)
		W3-QAIRG-1392 (5/4/84)	W3K84-1378 (6/7/84)

ATTACHMENT 1
(continued)

SUS	LP&L COMMENTS	EBASCO RESPONSE	LP&L ACCEPTANCE
56A	W3K-83-0477 (4/11/83)	W3-QAIRG-0480 (5/12/83)	W3K84-1563 (7/5/84)
		W3-QAIRG-1400 (5/4/84)	W3K84-1563 (7/5/84)
59	W3K-83-1353 (9/14/83)	W3-QAIRG-1403 (5/4/84)	W3K84-1421 (6/15/84)
60B	W3K-83-1936 (12/7/83)	W3-QAIRG-1395 (5/4/84)	W3K84-1564 (7/6/84)
71B2	W3K-83-1140 (8/5/83)	W3-QAIRG-1393 (5/4/84)	W3K84-1565 (7/6/84)
72A	W3K-82-0733 (11/2/82)	W3-QAIRG-0192 (12/1/82)	W3K84-1377 (6/12/84)
91E	W3K-83-1859 (11/29/83)	W3-QAIRG-1112 (1/9/84)	W3K84-1568 (7/6/84)
		W3-QAIRG-1112 S1 (5/9/84)	W3K84-1568 (7/6/84)

* This listing gives the letter numbers with issuance dates in parenthesis.

ATTACHMENT 2
DESCRIPTION OF SYSTEM STATUS AND TRANSFER REVIEWS

SUS	LP&L Letter	EBASCO Letter	INCOMPLETE RESPONSES Finding	Resolution/Answer
Walkdown 18-3	W3K-83-648 (5/18/83)	W3-QAIRG-1405 (5/9/84)	1. FW-5,6,18 and 19 not per As-built. 2. 22" separation on tubing instead of 24". 3. Flareless connectors not right.	1. Nonproblem per ASP-IV-79 2. FCR-ICP-672 written to accept this condition. 3. Reworked 12/22/83 per CIWA83E165
Walkdown 36-1	W3K-83-197 (2/17/83)	W3-QAIRG-1439 (6/7/84)	T-B undersized welds.	Generic problem addressed under SCD 74 at time of Finding.
Walkdown 36-3	W3K-82-183 (2/16/83)	W3-QAIRG-1440 (6/7/83)	1/4" fillet welds-potentially undersized.	Non-problem. This is acceptable per the ASME Code.
Walkdown 36-3	W3K-83-210 (2/18/83)	W3-QAIRG-1448 (6/13/84)	T-B undersized welds.	Generic problem addressed under SCD 74 at time of Finding.
Walkdown 43B	W3K-83-195 (2/17/83)	W3-QAIRG-1441 (6/7/84)	T-B undersized welds.	Generic problem addressed under SCD 74 at time of Finding.
Review 46B	W3K-83-613 (5/10/83)	W3-QAIRG-1450 (6/17/84)	AS-IC-1127-No spool number.	Line number wrong. Line was AC-IC-1177 and Iso. was revised to add spool number.
Walkdown 46B	W3K-83-557 (5/3/83)	W3-QAIRG-1396 (5/4/84)	OCR 1311 and 1223 had tubing with incorrect slope.	Tubing reworked by Mercury at time of Finding.
46C	W3K-83-196 (2/17/83)	W3-QAIRG-348 (2/28/83)	Non-problem. All Findings were responded to in Letter W3-QAIRG-348 (2/28/83).	
Walkdown 46E	W3K-83-728 (5/31/83)	W3-QA-28118 (4/17/84)	1. Loose Clamps. 2. High points in tubing. 3. Valve tag incorrect.	Findings 1 and 2 were added to the Area Walkdown Punchlists. 3. Reinspection found valve to be correctly tagged.
Review 46E	W3K-83-342 (3/17/83)	W3-QAIRG-1372 (4/17/84)	Various document deficiencies.	All deficiencies resolved prior to Ebasco issuing QA Transfer Letter W3-QAIRG-364RR on 11/3/83 for T-B.
Walkdown 46E	W3K-83-343 (3/18/83)	W3-QAIRG-1442 (6/7/84)	T-B undersized welds and various other problems.	SCD-74 and NCR-7680

ATTACHMENT 2
(continued)

INCOMPLETE RESPONSES

SUS	LP&L Letter	EBASCO Letter	Finding	Resolution/Answer
Review 46H	W3K-83-450 (4/8/83)	W3-QAIRG-483S1 (6/21/84)	Wrong washers installed.	Ebasco rework forms were initiated at time of Finding. Rework was complete on 5/25/83.
Walkdown 55A	W3K-83-688 (5/2[illegible]/83)	W3-QAIRG-1392 (5/4/84)	Various tubing problems.	W3-NCR-7147 and 7146 were written on 10/12/83 to address these problems. Both were closed on 11/7/83.
Walkdown 56A	W3K-83-477 (4/14/83)	W3-QAIRG-1400 (5/4/84)	1. Coupling not shown on Iso. 2. SW6R1 to 90° El. not flange.	1. Iso. revised per FCR-MP-219. 2. Correct. FW6R2 was to flange.
Walkdown 59	W3K-83-1353 (9/14/83)	W3-QAIRG-1403 (5/4/84)	1. FW not per CIWA814747. 2. No documentation for CIWAs 82A705 and 825039.	1. DN-SQ-745 (written 9/15/83) and CIWA83C259 were written at time of Finding to rework the FW. 2. CIWA82A705 was part of NCR-4552 and CIWA825039 was Non-Safety and in the CIWA Vault.
Review 60B	W3K-83-1936 (12/7/83)	W3-QAIRG-1395 (5/4/84)	OCR 2036 and 2037 had open 9.1s and 9.2s.	OCR-2036 was resolved 5/24/83. OCR-2037 was resolved 11/12/83.
Walkdown 71B2	W3K-83-1140 (8/5/83)	W3-QAIRG (5/4/84)	Various	NCR-7111 was written 10/6/83 to address Findings. L-CIWA004871 was written to perform rework. NCR closed 3/27/84.
72A	W3K-82-733 (11/2/82)	W3-QAIRG-192 (12/1/82)	Non-problem. All Findings were responded to in Letter W3-QAIRG-192 (12/1/82).	
Review 91E	W3K-83-1859 (11/29/83)	W3-QAIRG-1112S1 (5/9/84)	Various F&M documentation deficiencies.	Documentation problems were resolved mainly by obtaining additional information from F&M.